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MICROpendium

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The comments column may be used to provide more information about the disk contents or anything that may be of use to the user.

Inside:

—*A GPL Primer by Mack McCormick—Page 26*

—*GRAPHX vx. TI-Artist. Who wins?—Page 32*

—*Will U.S.-Japan chip agreement drive up prices for U.S. vendors?—Page 16*

Print your own disk jackets

See Page 12

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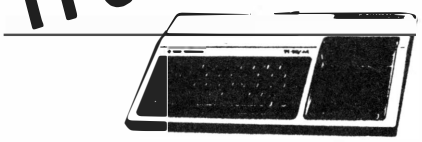

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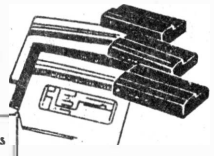

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—Part 2 of computer graphics design
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Table of Contents

Print disk sleeves with catalog

A quick glance at the outside will show you which files are on which disk.....Page 12

Chip pact may affect 99/4A

The U.S.-Japan anti-dumping agreement and its possible repercussions for the TI hardware market.....Page 16

Creating menus with Wycove Forth

Not having to remember which screen does what..Page 18

How a programmer learned to love GPL

Mack McCormick finds that it isn't cumbersome and slow, but a tool for efficiency.....Page 26

Super 4th

A new TI-Forth upgrade being marketed.....Page 31

GRAPHX vs. TI-Artist

Which graphics program is "better"? Well, that all depends on what you're looking for.....Page 32

Reviews

Mechatronic 128K card.....Page 32

Newsbytes

Disk Only Software is marketing MPB board kits, lots is on tap for Chicago's fourth annual TI-Faire, and Mechatronics' 80-column card will be out as soon as an English-language manual is developed.....Page 40

User Notes

A screen dump, adding DM1000 to GRAM Kracker, and integrating charts with your text.....Page 44

Classified.....Page 46

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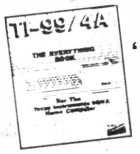

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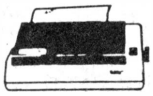

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Comments

Columnist wanted; a programming bargain

We've lost our BASIC columnist. Lee Wilkerson, who has written the column the past four months, has other things to do. Unfortunately, we also lost the names of several others who applied to write the column—writing when we inaugurated it last spring. This sounds a little flaky, but we'd like to hear from those who applied previously and any others who think they'd like to write about BASIC/Extended BASIC programming.

A PROGRAMMING BARGAIN

Reviewing Jim Peterson's Nuts and Bolts software is not easy to do. There's so much of it that it's hard to know where to start. Ending would just be arbitrary, in any case.

Peterson is familiar to TI users as the founder of Tigercub Software. His main products consist of a Tips from the Tigercub newsletter that he distributes to user groups and two disks of Nuts and Bolts utilities, which is the subject under consideration here.

Peterson is the prototypical kitchen-table programmer (and refers to himself as such). While other programmers busy themselves with creating ever-expanding volumes of code, Peterson is in the business of reducing his ideas to subprograms that can be used and expanded upon by others. By and large, the Nuts and Bolts series consists of subprograms saved in MERGE format that can be MERGEd into new or existing programs. All are numbered so that they may be merged without overwriting existing program lines. I hasten to add that these are designed to be used in Extended BASIC programs. Several require the use of an expansion memory but most may be used by anyone with a disk system and Extended BASIC.

What makes a review of the Nuts and Bolts series difficult is the sheer volume of subprograms. We are talking hundreds here. They range from custom character sets (including script, stencil, Greek and Russian); subprograms for controlling sprites, creating boxes and graphs; subprograms to edit, sort and save strings; subprograms to determine how much memory remains in stack memory and more. Here's a partial list of subprogram names from N&B No. 2. It should give you an idea of the range of subprograms typical of the series: BACKWARD, BIGLETTER, HEAVYCHAR, SIDEWAYS, TALLCHAR, UNDERLINE, BACKGROUND, BOX, CURTAIN3, ERRORSHOW, SCROLLDOWN, TELETYPE, VERTPRINT, JOYSPEED, COLORGRAPH, TRIGRAPH, INITCHECK, DCHAR, ACCEPTDUMP, EDITOR, EXTRACTOR, LINESAVER, SCREENSAVE, TRACEPRINT, MOUSE, INDEXSORT, TWOWAYSORT and so on.

It is not possible to recommend one of the Nuts and Bolts disks over the other. Each is packed with unprotected subprograms that are useful to any Extended BASIC programmer. I've used a number of the subprograms to customize programs I use regularly. They save time and I've learned a lot from observing how the subprograms work.

Each of the disks comes with ample documentation and examples of how to use each subprogram. The documentation for N&B No. 2 runs 10 pages. (Nuts and Bolts No. 1 includes a tutorial on using subprograms.)

Peterson isn't a heavy advertiser, relying mostly on word-of-mouth. The cost of Nuts and Bolts is $19.95 for one or $37 for both volumes. (Ordering information can be found in our classified section.)

EXCITEMENT UP AS FAIR SEASON STARTS

There are a number of TI computer fairs planning over the next couple months. Seattle, Chicago, Milwaukee and other places are planning conferences or shows. Unfortunately, we can't make it to all of them. However, we encourage any group that is planning a fair or special event to let us know about it so we can keep our readers informed. New products are obviously one of the drawing cards for any event, but just getting together with other TI users can be worth the cost of admission.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500

March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer

April: Monthly Budget$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh

May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer

June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II

July: Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position

August: TE-1200, Tower, Galactic Battle, Galaxy

September: Wycove Forth, 99/4 Auto Spell-Check, QUICKCOPYer, Wizard's Dominion, Anchor Automation Mk XII Modem

October: Killer Caterpillar, ZORK I, Defender

November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X

December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

January: Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner

February: Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II

March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor

April: 9900 Micro Expansion System, Disk+Aid, Gemini 10X-15X

May: Character Sets and Graphics Design, Draw 'N Plot

June: GRAPHX, DATA BASE I

July: Acorn 99, Advanced Diagnostics

August: Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll

September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion

October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1

November: Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor

December: Display Enhancement Package, Triple Tech

1986

January: BITMAC, Starcross

February: Night Mission, Peripheral Diagnostic Module, BA-Writer

March: Super Duper, Tunnels of Doom Editor, Business Graphs 99

April: U.S. Open Tennis, PRBASE

May: 4A Flyer, GRAM Kracker, Artist's Companion

June: Myarc Disk Controller Card, Maximem

July: Horizon RAMdisk, Old Dark Caves, Funlwriter, TI99/4A Macro Assembler

August: JOYPAINT 99, GPL Assembler, TI99/4A INTERN, GPL Linker

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Feedback

Effect of U.S.-Japan accord on hardware

I am sure that your readers have been reading the headlines in their local papers concerning the U.S. government's recent agreement with the Japanese manufacturers of semiconductors. To most computer users this information would at first appear distant and of little consequence to them. However, they will begin to see price increases on computer hardware. This will especially be true of products made in the U.S.A. such as CorComp products.

Briefly, our government and American manufacturers of semiconductors, specifically DRAMs and EPROMs, have taken steps to stop the Japanese manufacturers from "dumping" chips into our market at below their cost. This has been going on for several years, especially since the industry slump in 1983.

The results of this pact between the U.S. and Japan will constitute a price increase to our distributors. The FMV (Fair Market Value) has not yet been set but the expected price floor to the wholesaler will be two to three times the current price. Naturally, our distributors must pass that cost on to us and, of course, that will affect the final retail price.

We have stayed on top of this issue ever since negotiations began. Our distributors have worked with us to secure us the lowest prices under their current constraints. We feel good about our situation and will continue to produce 17 products for the 99/4A market. We build all our products in the U.S.A. and will not jeopardize quality by going to Taiwan, Korea or Hong Kong. It is only a matter of time before agreements will stop these countries from unethical practices that are costing Americans jobs and American industry billions of dollars in revenue.

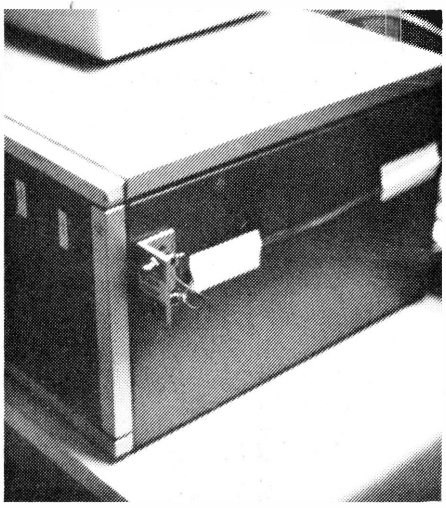
Jackirae Sagouspe
President, CorComp Inc.
Anaheim, California

Un-holey solution

I am indebted to Kurosh Amirkhani for his article in the March 1986 issue about the extension of the Triple Tech controls.

However, I was reluctant to drill holes in the console, so I brought the leads out to the right side of the PE box and fastened a bracket for the switches with double-sided adhesive tape—no holes required—picture enclosed.

Richard R. Hay
San Diego, California



Separate 32K called advantage to user

MICROpendium's review of the Horizon RAMdisk card (July 1986)...was fair and accurately represented our product.

However, we felt we had to respond to one comment in the review. The reviewer wrote that a disadvantage of the Horizon RAMdisk was the fact that it requires a separate 32K memory expansion. In our opinion this is an advantage to the user, especially in terms of flexibility of use, and not a disadvantage, for two reasons.

Firstly, if the user already has a 32K card or has added 32K internally to his console, he doesn't have to negate his present investment to use our card. Secondly, not including the 32K memory expansion on the Horizon RAMdisk means that you can use multiple Horizon RAMdisks in one PE-box and that it is compatible with other peripheral cards that do supply the 32K expansion. It is, by the way, compatible with all existing hardware for the 99/4A. In any one system only one peripheral card can carry the 32K memory expansion; 32K memory expansions on multiple peripherals will conflict and likely lock up the computer.

David R. Romer
Horizon Computer Limited
Walbridge, Ohio

On flight simulator

This is an open letter to John Dow in response to his letter in the July issue:

I am extremely pleased to hear that you are working on a "true" flight simulator program for the TI. Based on your description, I can only say that I cannot wait to purchase the program from you immediately upon its completion.

You are right in your statement that 4A Flyer doesn't qualify as a flight simulator. As far as I'm concerned there is no TI program that fits my definition of a true flight simulator. I must include your Dow-4 Gazelle program. The reason I say this is quite simple. Most people who buy flight simulator programs are not pilots. Their idea of a flight simulation program is based on their perception of what the pilot visually observes from the cockpit. Unfortunately instrument flying is difficult if not impossible for a nonaviator to conceptualize. Therefore, while an instrument simulator may be extremely accurate and realistic it does not qualify as a "true flight simulator." Please do not take offense. I have your program and I enjoy it very much but it does nothing to satisfy an ex-aviator's need to experience seeing the horizon move, seeing obstacles, banking, turning and all of the other sensory perceptions connected with flying.

If [your program] performs as well

(Please turn to Page 10)

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Feedback

(Continued from Page 8)

as you have described it should be terrific. As to the cost, only you know how much time and effort is going into the creation of the program. I will say this, however. My son owns an Apple 2c and I buy him programs for it "over the counter." Most of the programs are sophisticated war games. The average cost of these programs is about $40. I realize that Apple mass markets their stuff so there is no way of making a direct comparison on worth. Chances are you will never sell as many of your programs as Apple sells of theirs.

But I will say this. A "good" program for the TI which satisfies an existing need (in my estimation) should be worth between $20 and $40. I personally would be willing to pay $40 for a well-done flight simulator program. Let's face it, I would like to pay less but I have found that in most cases you get what you pay for and there is a big difference between "cheap" and "inexpensive." I want a good flight simulator program; therefore, I am willing to pay the price.

I also took note of your disclaimer. I couldn't agree with you more that the pirates are well on their way to destroying the TI. I don't know what the answer is to this serious problem. However, I do have a suggestion. Maybe if a program author dealt more with the TI clubs and users groups rather than selling to individuals he would fare better. This of course assumes that the TI group is responsible and takes an active part in controlling pirating in its own organization. Let's face it. Most pirates belong to a users group and pirate with each other.

Chris C. Agrafiotis
Hooksett, New Hampshire

On track copiers

I am writing in regards to your editorial in the August 1986 issue regarding track copiers in hopes that I may clear up a very common misunderstanding.

You state that "Track copiers are designed to copy any disk, regardless of the protection measures." This is not quite true. Track copiers are NOT the final word in the never-ending battle between publishers and pirates. A track copier is merely the next generation of copiers, the previous generation being Sector Copiers. ALREADY there is at least one commercial program in existence that cannot be copied by the current (and upcoming) rash of track copiers. Thus your statement that track copiers can copy ANY disk is untrue. Although track copiers can copy software that sector copiers cannot, the track copier is not the ultimate copier by any means.

I find it very distressing and tiring to hear leading TI software publishers complain that track copiers spell the end of disk-based software, since I have PROOF that such copiers can be defeated with effort not much greater than it took to develop existing protection schemes. This is a never-ending cycle, and if a company chooses to take the route of software protection, it knows FULLY well what kind of vicious circle it is getting into. I find nothing "amazing" or "earth-shattering" about track copiers.

A track copier is to a sector copier what TI ARTIST 2.0 is to the VIDEO GRAPHS cartridge by TI. Simply evolution.

Warren Agee
Livonia, Michigan

Not even your fingers would be walking

I am a TI owner with two spare complete outfits and I use my modem a lot.

I use 4A Talk and I think it is about the best that I have seen for my needs. However, I do have a suggestion for any programmers out there. It would be great if you had a directory such as in 4A Talk that would dial the board that you selected just as it does now but with a choice that if there was no response it would go on to the next number and dial it and so on until it connected to one of them. If anyone knows of a directory that does this I would like to know.

Paul Lambert
Rialto, California

Questions answered

Re "Wishes for TI-Writer" (Feedback, Aug. '86):

1) Joystick control of the cursor is ruled out because a BLWP to KSCAN in mode 1 fot the joystick followed by a mode 4 BLWP for the keyboard messes up bit 2 of byte 837C (Hex). The computer could not tell a new keystroke from a key held down.

2) I don't know about TI-Writer, but with my word processor, control L means go to the top of the next page.

3) Printer pause on the Brother or Comrex printers is Control S. (I am not sure, but I think FCTN U followed by S [upper case] would work for TI-Writer.)

4) I don't have an answer.

5) TI-Writer is not set up for proportional spacing, but mine is. (I do not use TI-Writer, but use my own word processor.)

6) No answer.

7) Again no TI-Writer answer. With my word processor, Control 1 is the CHR$(27) key. Control 1 + E = start auto underline. Control 1 + R = end auto underline. Control 1 + W = start shadow printing. Control 1 + & = clear shadow, double strike or bold.

8) My word processor will send any character 0 to 126 to a Brother or Comrex printer, but is incompatible with printers using the 8th bit.

9) A COMBINE128 utility program in my word processor package will merge two text files from my editor without overwriting.

Walter Tietjen
Raleigh, North Carolina

An article on Tietjen's word processing program appears in the May 1986 MICROpendium.—Ed.

The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. We ask that writers restrict themselves to one subject for the sake of simplicity.

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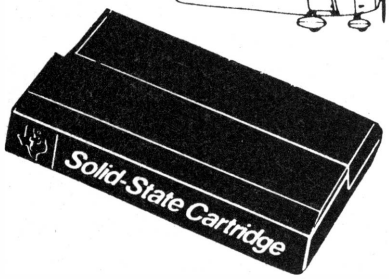

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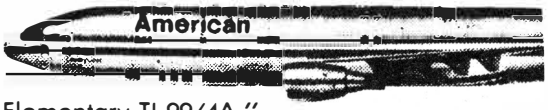

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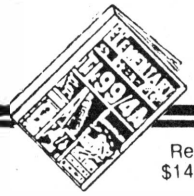

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Keep track of what's on your floppies

Print disk sleeves with catalogs

By WILLIAM R. BROWN

This is a program that produces a sleeve for disks that has printed on it a catalog of the files in the disk.

The format of the printout has a header which lists an identifying name and a date. Then it breaks down into three rows or columns. The first two rows contain disk catalog information and the third row is for comments.

The beginning of the first row is the disk's name, the number of sectors used and the number of sectors available. Next comes a list of the programs or files by their filename, the number of sectors they occupy, the type of file and whether the file is file protected or not. All this is in the same format as that used by the Disk Manager module.

The program will handle single-sided disks, double-sided disks or single-sided, double-notched disks. For single-sided and double-sided disks, the listing will start in the first row and continue down for 34 lines. Then, if needed, it will continue at the top of the second row for an additional 34 lines. For double-notched disks, the listing will start in the first row listing the front side of the disk. Another listing will start in row two listing the back side of the disk. Should either side require more than the 34 lines available, it will continue in the adjoining row. Then the next disk's listing of the comments will proceed on down the row. Remarks or comments can be included and these will be in row three. The user has available 34 lines of 28 characters each.

This program has an additional option that will print out a page of the above information. This page is formatted to produce a 6 x 9-inch sheet for use in a medium-sized three-ring binder. The remarks, if they are included, will be saved to the disk in a Display/Variable 80 file for future use. The program provides for a screen

(Please turn to Page 14)

Disk Sleeve Printer

```
100 ! Filename SLEEVE3
110 ! ********************************
120 ! *                              *
130 ! *    DISK SLEEVE PRINTER       *
140 ! *        VERSION 3.0           *
150 ! *                              *
160 ! *     by Wm. R. Brown          *
170 ! *   Sun City User's Group      *
180 ! *       El Paso, Texas         *
190 ! *                              *
200 ! ********************************
210 ! DISK SLEEVE PRINTING PROGRAM VERSION NO. 3.0
220 ! USES TI EXTENDED BASIC, DISK DRIVE, EXPANSION MEMORY AND PRINTER
230 DIM A$(103):: DIM W$(200):: DIM M$(3):: B$=RPT$(" ",19):: CALL CLEAR :: CALL
 SCREEN(5):: FOR B=0 TO 12
240 CALL COLOR(B,16,5):: NEXT B
250 DISPLAY AT(2,4):"'DISK SLEEVE PRINTER'": :TAB(8);"VERSION  3.0"
260 DISPLAY AT(6,7):"by Wm.R.Brown"
270 DISPLAY AT(8,4):"Sun City Users Group": :TAB(7);"El Paso, Texas"
280 DISPLAY AT(17,4):"ENTER DATE- MO-DY-YR";DATE$ :: ACCEPT AT(17,16)SIZE(-8)BEE
P:DATE$ :: Z=0
290 DISPLAY AT(19,3)BEEP:"ENTER IDENTIFING NAME:   ": :"WILLIAM R. BROWN" :: ACC
EPT AT(21,1)SIZE(-28):ID$
300 DISPLAY AT(23,5)BEEP:"ENTER PRINTER NAME":"PIO" :: ACCEPT AT(24,1)SIZE(-28):
C$ :: OPEN #1:C$,VARIABLE 132 :: CALL CLEAR
310 DISPLAY AT(6,4):"DO YOU WANT": :TAB(4);"1. SLEEVE ONLY": :TAB(4);"2. CATALOG
 PAGE ONLY": :TAB(4);"3. BOTH": :TAB(4);"ENTER 1, 2 OR 3"
320 ACCEPT AT(14,20)SIZE(-1)VALIDATE("123")BEEP:S$
330 DISPLAY AT(18,4)BEEP:"WISH TO ADD COMMENTS": :TAB(4);"PRESS 1 FOR NO": :TAB(
4);"PRESS 2 FOR YES"
340 ACCEPT AT(22,20)SIZE(-1)VALIDATE("12")BEEP:T$ :: CALL CLEAR :: IF T$="2" THE
N 350 ELSE 380
350 DISPLAY AT(2,4):"YOU CAN WRITE 33 LINES": :"   OF TEXT WITH A MAXIMUM"
360 DISPLAY AT(6,4):"OF 28 CHARACTERS  EACH": :"   FOR THE COMMENT COLUMN."
370 DISPLAY AT(16,7):"DOES DISK HAVE": :TAB(5);"COMMENTS FILE (Y/N)  Y" :: ACCEP
T AT(18,26)SIZE(-1)VALIDATE("YN")BEEP:U$ :: CALL CLEAR
380 A,C=0 :: DISPLAY AT(16,1):TAB(4);"PLACE DISK IN DRIVE #1": :TAB(6);"THEN PRE
SS ENTER" :: ACCEPT AT(18,23)SIZE(-1)VALIDATE("")BEEP:Z$
390 !
400 ! DISK CATALOG INFO TO BUFFER
410 !
420 DISPLAY AT(21,1):"": :TAB(9);"READING DISK" :: OPEN #2:"DSK1.",INTERNAL,RELA
TIVE,INPUT
430 D$(1)="DIS/FIX " :: D$(2)="DIS/VAR " :: D$(3)="INT/FIX " :: D$(4)="INT/VAR "
 :: D$(5)="PROGRAM    "
440 INPUT #2:E$,F,F,D :: C=C+1 :: A$(C)=E$&SEG$(B$,1,16-LEN(E$))&"   = DISKNAME"
 :: C=C+1 :: A$(C)="AVAILABLE= "&STR$(D)&"      USED= "&STR$(F-D)
450 A$(C)=A$(C)&SEG$(B$,1,29-LEN(A$(C)))
460 C=C+1 :: A$(C)="FILENAME   SIZE    TYPE     P" :: C=C+1 :: A$(C)="----------
 ---- ---------- -"
470 IF C=102 THEN 590 ELSE INPUT #2:E$,G,F,D :: IF E$="" THEN 510 ELSE C=C+1 ::
F$=STR$(G):: G$=STR$(F):: H$=STR$(D)
480 IF G<1 THEN I$=" Y" ELSE I$="  "
490 IF ABS(G)=5 THEN J$="" :: GOTO 500 ELSE J$=SEG$("000",1,3-LEN(H$))&H$
500 A$(C)=E$&SEG$(B$,1,12-LEN(E$))&G$&SEG$(B$,1,3-LEN(G$))&" "&D$(ABS(G))&J$&I$
:: GOTO 470
510 IF A=0 THEN M$(1)=STR$(C-4)ELSE M$(2)=STR$(C-38)
520 FOR C=C+1 TO 32 :: A$(C)=RPT$(" ",29):: NEXT C :: CLOSE #2
530 ! BACK SIDE OF DISK CAT INFO TO BUFFER
540 !
550 IF A=0 THEN DISPLAY AT(21,1)BEEP:TAB(6);"PRESS 1 FOR FLOPPY": :TAB(6);"PRESS
 2 FOR FLIPPY" :: A=1 ELSE 590
560 CALL KEY(0,D,E):: IF D=-1 THEN 560 ELSE IF D=50 THEN 570 ELSE IF D=49 THEN 5
90 ELSE 560
```

(Please turn to Page 14)

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SLEEVE—

(Continued from Page 12)

review of the remarks and they can be edited, deleted or appended. The editing abilities of this program are limited but do allow the user to make modifications easily. The remarks data file can be written by this program or by TI-Writer. If the COMMENTS data file is produced by using the TI-Writer, the line width must be limited to 28 characters and no more than 34 lines. The file name must be "COMMENTS" and it must be in disk drive 1 when the program is running. It is recommended that this file be located on the disk that it references, otherwise there will be a lot of disk juggling while executing the program.

USING THE PROGRAM

This program operates in Extended BASIC and needs at least one disk drive, 32K memory expansion and a printer. The program is written using the printer instruction codes for the Gemini 10X printer. If another printer is to be used, then a review of the various printer codes needs to done and any differences should be incorporated into the program before using it.

The program starts with a title screen containing prompts. The first prompt requests the date. The next prompt is for an identifying name. There is a default name which can be used by pressing ENTER or a new name can be typed in and then entered. The last prompt is for the printer's name. This too has a default name, "PIO," but any name may be entered. After this prompt a new screen appears. The first prompt offers the following selection:

1. Sleeve only
2. Catalog Page only
3. Both.

The next prompt asks whether any COMMENTS are to be added. If this prompt is answered affirmatively, then a new screen comes up giving instructions and asks if there is already a COMMENTS file on the disk. When this is entered another screen comes up requesting that your disk be put in

(Please turn to Page 16)

Disk Sleeve Printer

(Continued from Page 12)

```
570 C=C+1 :: A$(C)=RPT$(" ",29):: DISPLAY AT(21,1):TAB(8);"FLIP DISK OVER": :TAB
(5);"THEN PRESS <ENTER>"
580 ACCEPT AT(23,23)BEEP SIZE(-1)VALIDATE(""):Z$ :: GOTO 420
590 A$(C)=RPT$(" ",29):: CALL CLEAR :: FOR C=C+1 TO 67 :: A$(C)=RPT$(" ",29):: N
EXT C
600 !
610 IF T$="2" THEN 620 ELSE 780
620 IF U$="Y" THEN 660 ELSE 720
630 !
640 ! WRITING COMMENTS TO BUFFER
650 !
660 OPEN #3:"DSK1.COMMENTS",UPDATE
670 FOR X=1 TO 24 :: INPUT #3:W$(X):: DISPLAY AT(X,1):W$(X):: NEXT X
680 FOR X=25 TO 34 :: INPUT #3:W$(X):: NEXT X :: CLOSE #3
690 X=1
700 ACCEPT AT(X,1)SIZE(-28):W$(X):: IF W$(X)="" THEN 780 ELSE C=C+1 :: A$(C)=W$
(X):: X=X+1 :: IF X>24 THEN 710 ELSE GOTO 700
710 PRINT W$(X):: ACCEPT AT(23,1)SIZE(-28):W$(X):: IF C>102 THEN 780 ELSE C=C+1
:: A$(C)=W$(X):: X=X+1 :: GOTO 710
720 X=1
730 ACCEPT AT(X,1)SIZE(-28):W$(X):: IF W$(X)="" THEN 780 ELSE C=C+1 :: A$(C)=W$
(X):: X=X+1 :: IF X>24 THEN 740 ELSE 730
740 PRINT W$(X):: ACCEPT AT(23,1)SIZE(-28):W$(X):: IF C>102 THEN 780 ELSE C=C+1
:: A$(C)=W$(X):: X=X+1 :: GOTO 740
750 !
760 ! CLEARING BUFFER
770 !
780 IF C=102 THEN 840
790 DISPLAY AT(21,7):"CLEARING BUFFER" :: FOR B=C+1 TO 102 :: A$(B)=RPT$(" ",29)
:: NEXT B
800 IF T$="2" THEN 840 ELSE 860
810 !
820 !COMMENTS OUTPUT TO DISK FILE
830 !
840 OPEN #3:"DSK1.COMMENTS",OUTPUT :: FOR X=1 TO 34 :: PRINT #3:W$(X):: NEXT X :
: CLOSE #3
850 !
860 CALL CLEAR :: IF S$="2" THEN 1180 ELSE 910
870 !
880 !
890 ! SLEEVE PRINTING ROUTINE
900 !
910 DISPLAY AT(21,6):"PRINTING SLEEVE" :: PRINT #1:CHR$(27);"0";CHR$(15);CHR$(27
);"M";CHR$(10);CHR$(27);"D";CHR$(20);CHR$(119);CHR$(0)
920 PRINT #1:"INSTRUCTIONS: 1) TRIM AT DOTTED LINES  2) FOLD AT DASHED LINES  3
) THEN GLUE BACK FLAPS"
930 PRINT #1:CHR$(27);"U";CHR$(1);RPT$(".",120):: B=1 :: PRINT #1:".";RPT$(" ",9
);CHR$(245);RPT$(" ",3);ID$;RPT$(" ",39-LEN(ID$));"DATE: ";DATE$;RPT$(" ",21);
940 PRINT #1:"COMMENTS";RPT$(" ",13);CHR$(245);RPT$(" ",9);"." :: B=2 :: PRINT #
1:".";RPT$(" ",9);CHR$(245);RPT$(" ",3);RPT$("-",LEN(ID$));
950 PRINT #1:RPT$(" ",39-LEN(ID$));RPT$("-",14);RPT$(" ",21);RPT$("-",8);RPT$("
",13);CHR$(245);RPT$(" ",9);"."
960 FOR B=1 TO 29
970 PRINT #1:".";CHR$(9);CHR$(245);"   ";A$(B);" : ";A$(B+34);" : ";A$(B+68);CHR
$(9);CHR$(245);"        ";"."
980 NEXT B
990 FOR B=30 TO 32 :: PRINT #1:RPT$(" ",(B-29)*2);".";CHR$(9);CHR$(245);"   ";A$
(B);" : ";A$(B+34);" : ";A$(B+68);CHR$(9);
1000 PRINT #1:CHR$(245);RPT$(" ",(34-B)*2-1);"." :: NEXT B
1010 B=33 :: A$(B)=RPT$(" ",33):: PRINT #1:RPT$(" ",(B-29)*2);".";CHR$(9);CHR$(2
45);A$(B);": ";A$(B+34);" : ";A$(B+68);CHR$(9);
1020 PRINT #1:CHR$(245);RPT$(" ",(34-B)*2-1);"."
1030 B=34 :: PRINT #1:" ";CHR$(9);".";"   ";A$(B);" : ";A$(B+34);TAB(68);" : ";A
$(B+68);CHR$(9);"."
1040 PRINT #1:RPT$(" ",11);RPT$("-",98):: FOR B=1 TO 37 :: PRINT #1:RPT$(" ",11)
;".";RPT$(" ",96);"." :: NEXT B
```

(Please turn to Page 16)

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SLEEVE—

(Continued from Page 14)

DSK1. After putting in the disk, then press ENTER. The screen will then show "READING FILE." After the computer has read the disk a new screen comes up asking if this is a flippy or a floppy disk. A flippy disk is one that has been double-notched so that it is used like two single-sided disks. If a flippy has been entered, then another "READING" screen comes up.

If, at this point, there are to be no comments, the program then goes to the next screen which says "CLEARING BUFFER." Otherwise, if there are "COMMENTS" to be added, then a blank screen comes up with the cursor flashing in the upper left hand corner. Or, if there is a data file, the first 24 lines will come up on the screen with the cursor in the upper left hand corner. You may enter new comments or leave the existing comments unchanged.

The left and right arrow keys operate as cursor control keys. The up or down arrow keys take you to the next line down. (I have not figured out a way to get the up arrow key to move the cursor to the previous line.) Either pressing ENTER or the down arrow takes the cursor to the next line down without affecting any of the characters on that line. When Line 24 is reached you are at the bottom of the screen. By pressing ENTER, Lines 25-34 will scroll up line by line. Pressing ENTER at Line 34 enters the text into the buffers. However, if you want to enter your text before reaching Line 34, you do so by placing the cursor on a blank line, press CONTROL Q and then press ENTER.

At this point the screen will show "CLEARING BUFFERS" unless you have filled all lines with text. Then it goes to "PRINTING SLEEVE" or "PRINTING CATALOG PAGE." After the printing is completed, the screen prompt asks "PRINT ANOTHER SLEEVE OR CATALOG PAGE." If "yes" is entered here, then the second screen comes up and you start over with a different disk to be cataloged.

Disk Sleeve Printer

(Continued from Page 14)

```
1050 FOR B=1 TO 4 :: PRINT #1;RPT$(" ",11+B*2);".";RPT$(" ",96-B*4);"." :: NEXT
B
1060 PRINT #1;RPT$(" ",21);RPT$(".",78);CHR$(27);"U";CHR$(0):: PRINT #1;CHR$(12)
;CHR$(27);"@"
1070 !
1080 ! RERUN PROGRAM ROUTINE
1090 !
1100 IF S$="1" THEN 1110 ELSE 1180
1110 DISPLAY AT(20,2):"PRINT ANOTHER SLEEVE OR": :"CATALOG PAGE? (Y/N)  Y"
1120 ACCEPT AT(22,22)SIZE(-1)BEEP VALIDATE("YN"):Z$
1130 IF Z$="Y" THEN 1140 :: PRINT #1;CHR$(27);"@" :: CLOSE #1 :: END
1140 CALL CLEAR :: GOTO 310
1150 !
1160 ! PRINT CAT PAGE ROUTINE
1170 !
1180 DISPLAY AT(21,3):"PRINTING CATALOG PAGE" :: PRINT #1;CHR$(27);"2";CHR$(27);
"D";CHR$(20);CHR$(119);CHR$(0);CHR$(27);"U";CHR$(1)
1190 PRINT #1;CHR$(27);"M";CHR$(0):: PRINT #1;CHR$(27);CHR$(69): :TAB(25);"DISK
CATALOG"
1200 PRINT #1;CHR$(27);CHR$(70);CHR$(27);"B";CHR$(2);CHR$(27);"G";TAB(4);"Identi
fing Name:  ";ID$;TAB(52);"Date: ";DATE$: :
1210 PRINT #1;TAB(9);"FRONT SIDE";TAB(32);"BACK SIDE";TAB(55);"COMMENTS"
1220 PRINT #1;TAB(9);RPT$("-",10);TAB(32);RPT$("-",9);TAB(55);RPT$("-",8):: PRIN
T #1;CHR$(27);"H";CHR$(15)
1230 PRINT #1;TAB(6);"Contains "&M$(1)&" programs on disk";TAB(39);"Contains "&M
$(2)&" programs on disk" :: PRINT #1:
1240 FOR B=1 TO 32
1250 PRINT #1;TAB(4);"  ";A$(B);" | ";A$(B+34);" | ";A$(B+68)
1260 NEXT B :: B=33 :: PRINT #1;A$(B);TAB(35);" | ";A$(B+34);" | ";A$(B+68)
1270 B=34 :: PRINT #1;TAB(5);" ";A$(B);" | ";A$(B+34);TAB(67);" | ";A$(B+68):: P
RINT #1;CHR$(27);"U";CHR$(0);CHR$(12):: GOTO 1110
```

Line 290 is where the default identifying name can be changed and line 300 is where the default printer's name can be changed. The sleeve printing routine starts at line 910 and goes to line 1060. The catalog page printing routine starts at line 1180 and goes to line 1270.

THE PROGRAM

Chip pact may affect 99/4A market

By LAURA BURNS

In the nineteenth century, according to W.S. Gilbert, the "gentlemen of Japan" were to be found in western households "on many a vase and jar, on many a screen and fan."

These days, the Japanese are no less ubiquitous, but not quite as visible. Rather than their images on their imported goods, it is their technological components that are to be found, even in end-products which are made in the U.S.

Concern as to what this situation is doing to the domestic semiconductor industry and the U.S. balance of payments led to U.S. Department of Commerce negotiations with the Japanese resulting in a trade agreement July 30.

The accord calls for new foreign market value price structures for all 256-K DRAMs and EPROMs sold

(Please turn to Page 30)

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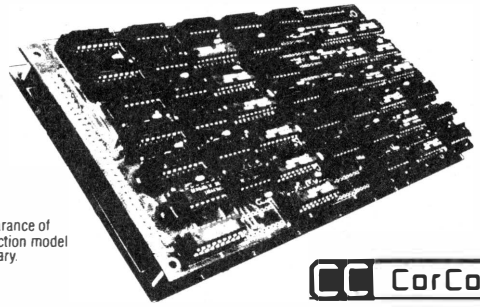

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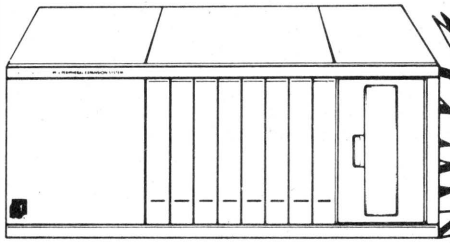

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Know where your screens are

Creating menus with Wycove Forth

By ROBERT M. CARMANY

As you probably know, there are two Forth language applications for the TI99/4A.

The first of these is the TI-released version that was "dumped" on the market just before they exited from the home computer market. It is available from any of the users' groups that were in existence (and recognized) before "Black Friday."

The other version is the one produced commercially by Wycove Systems and marketed as "Wycove Forth." This is the one that we will be working with.

The "other" Forth for the TI is Wycove Forth. It has the advantage of being thoroughly "de-bugged" and it runs like a charm. The only problem with it is that it doesn't present a neat little menu when the system loads. That can drive the prospective users crazy. Now, you ask yourself, was the application that you wanted to use on screen 56 or was it 58 or...? Now, you begin to see the only shortcoming that I have been able to find with Wycove Forth.

The solution to the problem is fairly simple once you examine all of the alternatives. First, you could move all of the screens up and place a menu on screen No. 1 which could be read and presented. That would distort all of the conditional load instructions on those screens that had them. You would then have to go back and rewrite all of the screens that contained a conditional load statement. WRONG! Too much work!

Second, you could simply transfer the current contents of screen No. 1 to an unused screen (like No. 67, for example) and put a menu in its place to be read and presented. But that is not really what I wanted to do. I would like for my application disk (or working copy) to remain essentially the same as it was originally.

The third, and best, solution is to create a menu that will be displayed when the system "boots" and can be accessed at any time. This is what we are going to be doing with Wycove Forth. With the Wycove Forth application disk in place (a copy, preferably), you can simply type in the following two screens as screen No. 67 and screen No. 68.

Lines 1 and 2 of the first screen define the word "LINE" to allow the placement of text strings at a specific line on the screen. The rest of the screen defines the various options available in terms of the screen at which they start loading.

The second screen defines the word "APP-MENU" and places the text strings on the screen at the respective lines. When this word is executed, it will produce a double column of options from which you can select. Some of the options have ben abbreviated (e.g., "T/M" for textmode and "B/M" for bit-map) and some have been worded to avoid duplicate definitions (e.g., "PRINTER-PIO" instead of just "PRINTER"). Incidently, the "TRACE" screen was "borrowed from TI Forth and it works fine!

Both screens can be loaded by typing in 67 LOAD. If you want them available when you load the system, you can follow this procedure:

1) After loading the basic Wycove system, type in 67 LOAD. This will load the "APP-MENU" screens into the basic system.

2) Type in the following line:

' APP-MENU CFA 'START-UP !

This will cause the word "APP-MENU" to be executed before you can do anything else when you enter Wycove Forth or "COLD START" the system.

3) Use the SAVE-SYSTEM word to save the system and have it available when you enter Wycove Forth. Simply type in:

DKS1 SAVE-SYSTEM

Now, you have the somewhat simple solution to having a menu appear when you start up your Wycove Forth system.

```
SCREEN #67
 0 ( Wycove Forth Menu, screen 1 0f 2 )
 1 : LINE SCREEN-WIDTH  SWAP OVER * DUP
 2   CURSOR-POS ! SWAP SPACES
 3   CURSOR-POS ! ;
 4 : SPEECH-CONTROL 49 LOAD ;
 5 : SOUND-CONTROL 65 LOAD ;
 6 : STRINGS 61 LOAD ;
 7 : RANDOM-NUMBERS 64 LOAD ;
 8 : USER-INT 44 LOAD ;
 9 : DIGIT-CLOCK 47 LOAD ;
10 : FILE CONTROL 11 LOAD ;
11 : PRINTER-PIO 14 LOAD ;
12 : FLOATING-POINT 16 LOAD ;
13 : GRAPHICS-WORDS 55 LOAD ;
14 : SPRITES-T/M 56 LOAD ;
15 : ASSEMBLER 36 LOAD ;
16 : TE-II-SPEECH 51 LOAD ;
17 : BIT-MAP 20 LOAD ;
18 : SPRITES-B/M 28 LOAD ;
19 : BIT-MAP/ED 31 LOAD ;
20 : TRACE 70 LOAD ;
21 : DISK-DIR 13 LOAD ;
22              -->
23
24
25
```

```
SCREEN #68
 0 ( Wycove Forth Menu, screen 2 of 2 )
 1 : APP-MENU CLS GRAPHICS
 2   6 LINE ."   SPEECH-CONTROL  USER-INT
 3   7 LINE ."   SOUND-CONTROL   STRINGS
 4   8 LINE ."   RANDOM-NUMBERS  DIGIT-CLOC
 5 K "
 6   9 LINE ."   FILE-CONTROL    PRINTER-PI
 7 0 "
```

(Please turn to Page 20)

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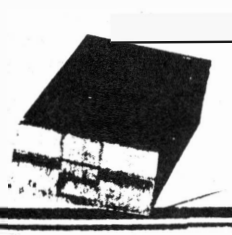

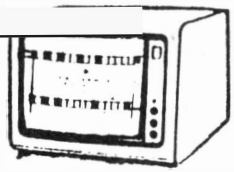

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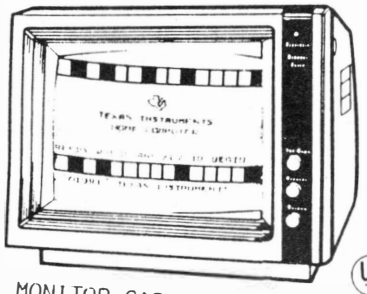

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MENU—

(Continued from Page 18)

```
 8   10 LINE ."   FLOATING-POINT   SPRITES-T
 9 /M"
10   11 LINE ."   GRAPHICS-WORDS   ASSEMBLER
11 "
12   12 LINE ."   TE-II-SPEECH     BIT-MAP "
13   13 LINE ."   BIT-MAP/ED       SPRITES-B
14 /M"
15   14 LINE ."   TRACE            DISK-DIR"
16   18 LINE ."    Enter your choice(s): "
17
18
19
20
21
22
23
24
25
```

The problem with that solution is that, while it works fine for a disk with fixed contents that contains both screens and the Forth system itself, you can't use it to read disks that may just have a number of screens on them. Luckily, there are screens that do just that. Tim MacEachern, the Wycove Forth vice president, has come up with some menu screens that take a different approach than the "hard coded" screens that we have just seen. These screens will read an application menu screen (like the example screen No. 1) and load the options by typing in the name of the application and the word "MLOAD". MLOAD is a menu-load word that was created to do just this job.

Since my system consists of a "working" copy of Wycove Forth with a slightly enhanced version of the basic application disk (containing the Forth image files and application screens) and several disks of pure screen files, I configured my system to incorporate both of the menu options. There is enough room on your application disk type in all four of the menu screens. ply type in screen No. 67 through screen No. 70 on your application disk.

Follow this procedure to load both options:

1) Start with the basic system without any options loaded.

2) Type in screens 67 through 70. NOTE: follow the editing instructions to access a blank screen.

3) Type in 67 LOAD to load the APP-MENU screens.

4) Type in 69 LOAD to load the MENU screens.

5) Type in 63 LOAD to load COMP$.

6) Type in: ' APP-MENU CFA 'START-UP !

7) Type in: DSK1 SAVE-SYSTEM

Here are the two screens by Tim MacEachern that give you the option of reading a menu contained on screen

(Please turn to Page 22)

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MENU—

(Continued from Page 20)

No. 1 of your screens file. There is an example of how the first screen should be set up after the two MENU screens.

```
SCREEN #69
 0 ( MLOAD - load from directory menu )
 1 63 -LOAD COMP$
 2 : MLOAD ( MLOAD NAME -- ; menu load )
3 BL WORD IN @ BLK @
 4   HERE COUNT
 5   40 IN ! 1 BLK !
 6   SWAP OVER PAD SWAP MOVE PAD SWAP
 7   BEGIN
 8     OVER OVER
 9     BL WORD HERE COUNT
10 OVER C@ WHILE
11     COMP$ @=
12     BL WORD
13     IF
14 BASE @ HERE
15       DECIMAL NUMBER ROT BASE !
16       DROP LOAD
17       DROP DROP BLK ! IN ! ;S
18     ENDIF
19   REPEAT DROP DROP DROP DROP
20   TYPE ." ? not found. "
21   BLK ! IN ! ;
22
23          -->
24
25
SCREEN #70
 0 ( Menu words )
 1 ( MENU re-opens the screens file to
 2   make switching disks easier, unless
 3   screen 1 has been edited. )
 4
 5
 6 : MENU ( -- ; generate menu )
 7   R/W-CLOSE CR
8 1 BLOCK 2- DUP @ 0>
 9   IF 0 SWAP ! ELSE DROP ENDIF
10 IN @ BLK @ 40 IN ! 1 BLK !
11   CR ." APPLICATION" 9 SPACES ." SCREEN"
12   CR 26 0 DO ." -" LOOP
13   BEGIN
14     BL WORD HERE COUNT
15 OVER C@ WHILE
16     CR SWAP OVER TYPE
17     24 SWAP - 1 MAX SPACES
18     BL WORD HERE COUNT TYPE
19   REPEAT DROP DROP
20   CR BLK ! IN ! ;
21
22
23
24
25
```

SCREEN #1

0 (Application Directory)

(Please turn to Page 24)

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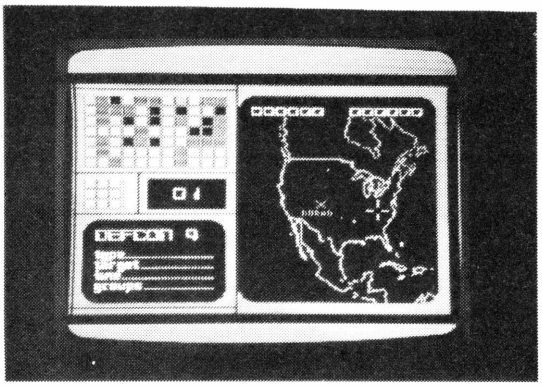

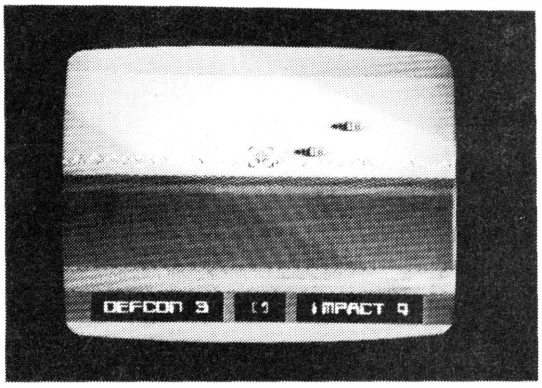

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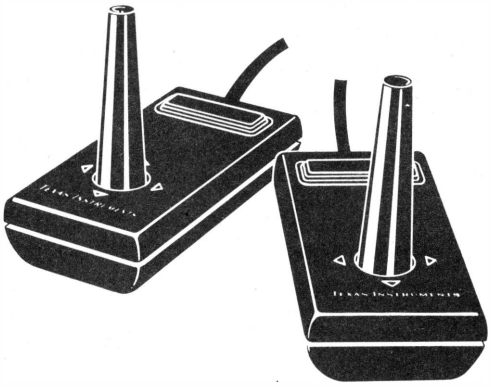

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MENU—

(Continued from Page 22)

```
1

2 SCREEN-MENU                2

3 SCREEN-COPY                4

4 DSR-CALLS                  7

5 READ-WRITE                 8

6 RENAME-FILE                9

7 SET-PROTECTION            10

8 FILE-CONTROL              11

9 DISK-DIRECTORY            13

10 PRINTER-PIO              14

11 FLOATING-POINT           16

12 FORMAT-DISK              19

13 FILE-DIRECTORY-INFO      22

14 READ-BLOCKS              23

15 WRITE-BLOCKS             24

16 STORE-FILE-INFO          25

17 2DRIVE-BACKUP            26

18 STRING-UTILITIES         29

19 DEVICE-LIST              30

20 TERMINAL-PROGRAM         31

21 RS232-INTERRUPT-INPUT    35

22

23

24

25
```

While these screens will enhance the basic Wycove system and make its initial appearance more "user friendly" and allow the user to access and load a menu from disks containing supplementary screens, they just barely scratch the surface as far as Forth applications are concerned. With these menu options in place, you can see what is on any of your screen disks and load them without having to refer to a book or a printout. I find that the inclusion of both the "hard coded" and "read and load" type of menu screens allows me more flexibility than I would have otherwise. I use the APP-MENU with the application disk in place and use MENU to access and load screens from the various other supplementary disks that I use with my system.

So, let's start from the beginning! First we are going to assume that when you have the application disk in its altered form in disk drive number 1. When you enter Extended BASIC (or load with any of the other modules), Wycove Forth will "boot" up and you will be presented with the menu and the Wycove Forth logo. You say that you want to list some screens or other information to your parallel printer. Type in "PRINTER-PIO". The disk drive will come on and Wycove will load the screens that are necessary for parallel printer support. After you are done, you decide to LOAD some of the other options. All you have to do is type in "APP-MENU" and the menu will appear again and you will be able to make your choice of screens. The "APP-MENU" word works both as a "START-UP" word and also can be accessed by simply typing in the word itself at any time that you desire.

Now, maybe you want to format a disk or some other task. Those screens are on your supplementary disk (you have placed a menu on screen No. 1 configured like the example). Just take the application disk out of the drive, insert the supplementary screen disk and type in "MENU". The disk drive will come on and the application menu will appear on the screen. The screens can be accessed either by typing in "xx LOAD" where xx is the screen number that you desire or by typing in "name MLOAD". In this case, you use the application name like "FORMAT-DISK" and MLOAD. The necessary screen or screens will then be loaded into the system.

This combination works quite satisfactorily when you are going to be working with both the application disk and one or more disks of supplementary screens. You will have no trouble displaying and loading screens from any of your Wycove Forth disks. These screens make the "other" Forth much easier to manipulate and its initial impression much more "user friendly."

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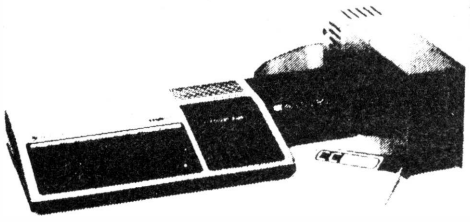

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How a programmer learned to love the efficiency of GPL

By MACK MCCORMICK

First a foreword. Please forgive the hiatus until last issue in my contributions to MICROpendium.

My job has been hectic, I've recently married (yeah!), and I've been spending a lot of time with our German TI counterparts learning all about the things they are doing. Things should be back on track each month from now on.

I have always avoided delving into the study of GPL (Graphics Programming Language) because I felt it was too difficult, cumbersome, executed too slowly, and had little to offer. Boy, was I wrong.

GPL makes writing routines used by BASIC a snap in assembler. For example, I recently needed a routine to read text from the screen which would allow full editing including erase, insert, delete, quit, bonk tone at right margin, and enter/up arrow/down arrow. I also wanted the neat auto-repeat feature used by TI where there is a slight pause before the key takes off repeating.

I began to consider writing the routine but then remembered that an identical routine resided in GPL in GROM (Graphics Read Only Memory) in the console. I first considered using the routine from GROM but then remembered that it added the screen offset of >60 to each character and I didn't need that. I could have done some fancy trick to make it work but decided to convert GPL to 9900 assembler code.

A second major reason for taking up GPL is the GRAM cards which are now available on the market. (See the review elsewhere in this issue on the German 128K GRAM Card.)

I've been having a blast using the German GPL assemblers and disassemblers. Makes GPL as much fun as assembly language, though not quite as fast. I also promise an article in the near future on constructing your own GPL cartridge for under $25. If there is enough interest in these articles I'll publish articles on a variable speed slow-motion device for the screen display, a 128K GRAM card for your PEB, building a DSR routine, and a mouse. Please write and let me know your interests so I may prioritize my work. **(Write Mack McCormick, HHC, 1ST INF DIV(FWD), APO NY 09137—Ed.)**

You'll find two programs here. One to link you to the routine in console GROM from a CALL LOAD from E/A BASIC and the almost identical routine in 9900 assembler code ready to link into any program you may have that needs this utility. I've included in the 9900 routine the actual GPL code used by the Pre-Scan routine of the monitor so you may see

(Please turn to Page 28)

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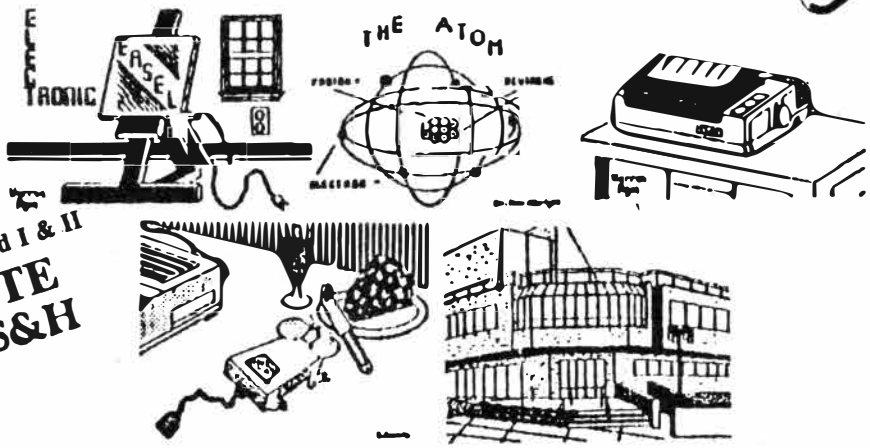

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GPL—

(Continued from Page 26)

what conversions were necessary. Try reading the GPL instructions (marked with three asterisks) to get a flavor for GPL. If the GPL gets in the way of using the routine in your program you may delete the GPL statements, however, they will have no effect if they remain.

It has become obvious to me why TI invented GPL, though I used to condemn them for it. The major reason is that it saves about 41 percent more code than straight assembler. GROM, as you may know, is used only by TI and is a chip which supplies a byte at a time to a memory-mapped address and auto-increments to the next byte (like VDP RAM) unless you change the address to be read from. It's a great way to save memory. TI calls it medium-speed memory. It is 6K bytes big and resides on 8K boundaries. It is an ideal medium to hold the console BASIC routines because the TMS9900 CPU chip in the console can only directly address 64K.

The GPL actually does not execute any code. GPL is interpreted in console ROM beginning at >0024 and extending to >0D18. This interpreter is straight assembler code which acts as directed by the GPL bytes coming from the GROM. Hence you see one reason TI BASIC is slow. It is interpreted by GPL and GPL is interpreted by assembler. Two interpretations! Instructions in GPL usually have two operands and most instructions can access RAM, GROM, or VDP RAM. Most instructions are single byte operands unless the operand is preceded by a D for double operand.

GPL uses two stacks a data stack at >83A0 and a subroutine address stack at >8380 (this allows arbitrary nesting of subroutines). Here are a few types of instructions:

DATA TRANSFER -Single/Double Byte
-Block to Block
-Formatted Block Moves
ARITHMETIC -add, subtract, multiply, divide, negate, absolute val.
LOGICAL -AND, XOR, Shifts.
CONDITION -Arithmetic and Logical
BRANCHING -Conditional/Uncond
BIT MANIPULATION -Set, reset, test.
SUBROUTINE -Call, Return
STACK OPNS -Push and Pop
MISC -Random Number, KSCAN, Coincidence Detection, Sound, I/O

The closest language to GPL is assembler and any experienced assembler programmer should have little difficulty learning GPL. One major difference is the use of MACRO instructions by the assembler such as REPEAT, UNTIL and IF...THEN...ELSE. It is very similar in this respect to 9900 assembly language.

A few words about how memory is addressed. Here are a few of the most common ways and their syntax:

—5 represents the decimal byte 5.

— >33 represents hex 33.

(Please turn to Page 29)

GPL READLN

```
      DEF  START
      REF  KSCAN,VSBW,VSBR,GPLLNK

* JUST A LITTLE ROUTINE TO TEST SUBROUTINE *
START  LWPI WS
      MOVB @H00,@KEYVAL SCAN ENTIRE KEYBOARD
LOOP   BL   @READLN
      DATA >002,>2FE    START, END POSITONS
      JMP  LOOP

*******************************************************************************
* This is the console GPL READLN routine at ()2A42 in BROM 1) converted to 9900
* assembler. Interprets BACKSPACE, INSERT, DELETE, and FORWARD. Uses SCRATCH
* PAD RAM. Total number of characters may be limited by changing the start
* value of ARG+2 (upper limit) and entering at READL1. VARW is the start address
* of the field. VARA is the current highest write address.
* Entering at READL1 allows us to pre-specify the minimum number of characters
* to be read for default creation.
* Entering at READ00 allows specification of the initial cursor position. In
* this case ARG+6 has to be set to the cursor position and ARG+4()0.
* Programmer responsibility to insure that VARW (= ARG+6 (= VARA (= ARG+2
* ARG+4 indicates if the line has been changed. If so, ARG+4=0.
* This is a possible call:
* BL   @READLN
* DATA >1DF,>35D   LOWER,UPPER SCREEN LIMITS
*******************************************************************************

* EQUATES *
WS     EQU  >8300        MY WORKSPACE
ARG    EQU  >835C
VARW   EQU  >8320        ABS LOWER LIMIT
VARA   EQU  >832A        CURRENT END OF LINE
TEMP   EQU  0            R0 USED FOR TEMP STORAGE
TEMP1  EQU  1            R1 USED FOR ADDL TEMP STORAGE
R1LB   EQU  WS+3
TEMP2  EQU  2
TEMP3  EQU  3
TIMER  EQU  >8379        VDP TIMER INC EVERY 1/60 SEC.
KEYVAL EQU  >8374        KEYBOARD TO SCAN
RKEY   EQU  >8375        KEY CODE
STATUS EQU  >837C        GPL STATUS BYTE

* CONSTANTS * (Should be EQU with byte values in code to save memory.)
H00    BYTE 0
H01    BYTE 1
HFF    BYTE >FF
H508   DATA 508
H60    DATA 60
H14    BYTE 14
H766   DATA 766

BREAK  BYTE >02
DLETE  BYTE >03
INSRT  BYTE >04
CLRLN  BYTE >07
BACK   BYTE >08
FORW   BYTE >09
DOWN   BYTE >0A
MVUP   BYTE >0B
CHRTN  BYTE >0D
CURSOR BYTE >1E
SPACE  BYTE >20
VARV   BYTE 0            (This is at >8301 in GPL but I use >8300 for workspace)
VAR1   DATA 0            AUTO REPEAT COUNTER (This is 1 byte at >830D in GPL)

EVEN

READLN
* The GPL code stores >35D at ARG+2 but to give more utility replaced with the
* next two lines of code.
***    DST  >35D,@ARG+2  GPL DOUBLE STORE
       MOV  *R11+,@VARW  START ADDRESS OF THE FIELD
       MOV  *R11+,@ARG+2 UPPER LIMIT
***    DST  @VARW,@VARA
       MOV  @VARW,@VARA  NOTHING ENTERED YET
* VARA SHOULD POINT TO A SPACE LOCATION OR END OF FIELD

READL1
***    ST   1,@ARG+4     STORE BYTE=1 TO ARG+4
       MOVB @H01,@ARG+4  MEANS NO CHANGE IN LINE
READL2
***    DST  @VARW,@ARG+5 HAD TO USE ARG+6 BECAUSE OF WORD BOUNDARY PROBLEMS
       MOV  @VARW,@ARG+6 POSITION CURSOR AT START OF FIELD
READ00
***    CLR  @VAR1        CLEAR BYTE. I HAD TO USE WORD BECAUSE 9900 IS SO MUCH
***                      FASTER
       CLR  @VAR1     COUNTER FOR AUTO REPEAT
* This is where we return to exit INSERT mode.
READ01
***    CLR  @ARG+7       USED ARG+8 BECAUSE HAD TO USE ARG+6 & ARG+7 ALREADY
       MOVB @H00,@ARG+8   NORMAL OPERATION MODE
***    ST   CURSOR,@VARV
       MOVB @CURSOR,@VARV VARV USED FOR CURSOR/CHARACTER
READ$1
* Input 1 char and alternate cursor and character for blink
***    EX   @VARV,RAM(@ARG+5) EXCHANGE @VARG WITH WHATS AT LOCATION ARG+5 IN VDP
       MOV  @ARG+6,TEMP  EXCHANGE VARV,ARG+6
       BLWP @VSBR
       SWPB TEMP1
       MOVB @VARV,TEMP1
       BLWP @VSBW
       MOVB @R1LB,@VARV
```

(Please turn to Page 29)

GPL—

(Continued from Page 28)

—&110011 represents binary 110011.

—#5506 represents the decimal number 5506.

—:A: is the ASCII equivalent >41.

Well, this has been a *very* general overview of GPL.

Let's look at some actual GPL source code and my interpretation of the 9900 assembler equivalent. This routine could have been shortened but I tried to keep it as close to GPL as possible. Hope you enjoy it. If you have questions just ask. My GPL manuals cover thousands of pages and we have just skimmed the surface here. One source for the GPL code in the console is available from Mechatronics, West Germany, in the book written by Heiner Martin called the TI Intern. A good job of disassembling the GPL code and commenting it. I've found very few errors in the book. (Reviewed in August 1986 MICROpendium—Ed.)

GPL READLN

(Continued from Page 28)

```
***     CLR  @TIMER
        MOVB @H00,@TIMER  BET VDP TIMER TO ZERO

***     $REPEAT           MACRO. REPEAT CODE UNTIL $UNTIL IS TRUE
L00001 LIMI 2             ENABLE INTERRUPTS SO THE VDP TIMER (>8379) CAN INC
        LIMI 0            DISABLE INTERRUPTS SO THE VDP WON'T GET MESSED UP
***     SCAN              SCAN THE KEYBOARD
        BLWP @KSCAN       SCAN FOR A CHARACTER
***     BS   READ$2       BRANCH ON COND BIT (EQ) SET
        MOVB @STATUS,@STATUS   EQUAL BIT SET?
        JNE  READ$2       FOUND A NEW CHARACTER
***     INC  @VAR1        INCREMENT THE BYTE @VAR1 BY ONE
        INC  @VAR1   INC AUTO-REPEAT COUNTER
***     $IF @RKEY .NE. >FF THEN  MACRO. IF RKEY NOT EQ >FF THEN EXECUTE THE
***                       FOLLOWING CODE OTHERWISE SKIP TO THE $END IF TERMINATOR
        CB   @RKEY,@HFF   OLD KEY?
        JEQ  L00002       YEP
***         $IF  @VAR1 .HE. 254 THEN  HIGHER OR EQUAL
        C    @VAR1,@H50B  HOLD OLD KEY FOR A WHILE
*                         HAD TO DOUBLE 254 TO SLOW DOWN ASSEMBLY CODE
        JLT  L00002       BEFORE STARTING REPEAT
***     SUB  30,@VAR1     SUBTRACT BYTE
        S    @H60,@VAR1   CONTROL REPEAT RATE
***     B    READ$3       UNCONDITIONAL BRANCH
        JMP  READ$3
***         $END IF
***     $END IF
***     $UNTIL @TIMER .H. 14  TERMINATOR FOR REPEAT UNTIL HIGHER THAN 14
L00002 CB   @TIMER,@H14
        JLE  L00001       TIME NEXT CHARACTER SWITCH
***     BR   READ$1       BRANCH COND BIT RESET. USED TO SAVE ONE BYTE OF MEMORY
        JMP  READ$1       RESTART CHAR BLINK CYCLE
READ$2
***     CLR  @VAR1
        CLR  @VAR1   CLEAR AUTO REPEAT COUNTER
READ$3
***     $IF  @VARV .NE. CURSOR THEN
        CB   @VARV,@CURSOR IF NE EXCHANGE AGAIN
        JEQ  L00003

***     EX   @VARV,RAM(@ARG+5)
        MOV  @ARG+6,TEMP  EXCHANGE VARV,ARG+6
        BLWP @VSBR
        SWPB TEMP1
        MOVB @VARV,TEMP1
        BLWP @VSBW
        MOVB @R1LB,@VARV

***     $END IF
***     $IF @RKEY .L. : : THEN   IF RKEY LESS THAN SPACE THEN EXECUTE CODE

L00003 CB   @RKEY,@SPACE IF .LT. SPACE THEN CONTROL CHAR
        JLT  L00004
        B    @L0000C

* THIS IS WHERE YOU WOULD TRAP ALL CONTROL CODES *
*  HANDLE BREAK CHAR FIRST
*       CB   @RKEY,@BREAK
*       JNE  LABLE

* BACK ARROW - SPACE BACK ONE POSITION
***     $END IF
***     $IF @RKEY .EQ. BACK GOTO RBACK  GOTO'S DO NOT REQUIRE AN END IF TERM

L00004 CB   @RKEY,@BACK  BACK ARROW?
        JNE  B00002       TO FIX OUT OF RANGE ERROR
        B    @RBACK

* RIGHT ARROW - FORWARD SPACE
***     $IF  @RKEY .EQ. FORW GOTO FORW
B00002 CB   @RKEY,@FORW
        JNE  B00003       TO FIX OUT OF RANGE ERROR
        B    @RFORW

* INSERT *
***     $IF @RKEY .EQ. INSRT THEN
B00003 CB   @RKEY,@INSRT
        JNE  L00005
***     ST   1,@ARG+8
        MOVB @H01,@ARG+8  SET INSERT MODE FLAG
***     $END IF

* DELETE - DELETE THE CURRENT CHAR
***     $IF @RKEY .EQ. DLETE THEN
L00005 CB   @RKEY,@DLETE
        JNE  L00006
***     CLR  @ARG+4
        MOVB @H00,@ARG+4  INDICATE A CHANGE IN LINE
***     $IF @VARA .DNE. @ARG+6 THEN  THE D MEANS DOUBLE OR WORD OF MEMORY COMPARE
        C    @VARA,@ARG+6 EMPTY LINE?
        JEQ  L0001F       YEP.
***     DST  @VARA,@ARG
        MOV  @VARA,@ARG   MOVE EVERYTHING FROM THE RIGHT
***     DSUB @ARG+5,@ARG  DOUBLE BYTE (WORD) SUBTRACT
        S    @ARG+6,@ARG  OF THE CURSOR TO THE LEFT
***     MOVE @ARG FROM RAM(1(ARG+6)) TO RAM(@ARG+5) THIS IS A BLOCK MOVE OF @ARG
***     BYTES OF VDP RAM FROM WHATS AT ADDR ARG+6 PLUS 1 TO WHATS AT ADDRESS
***     ARG+6. IN SHORT MOVE EVERYTHING ON SCREEN ONE BYTE LOWER.
        MOV  @ARG,TEMP2   COUNTER
        MOV  @ARG+6,TEMP

        INC  TEMP         MOVE @ARG FROM RAM(1(ARG+6)) TO RAM(@ARG+6)
L0000B BLWP @VSBR
        DEC  TEMP
        BLWP @VSBW
        INCT TEMP
        DEC  TEMP2
        JNE  L0000B

***     DDEC @VARA        DECREMENT THE WORD (DOUBLE) AT VARA
        DEC  @VARA        PRE-UPDATE END OF STRING

***     $IF RAM(@VARA) .EQ. : :+OFFSET GOTO READ01 OFFSET IS SCREEN OFFSET >60
        MOV  @VARA,TEMP
        BLWP @VSBR
        CB   @TEMP1,@SPACE
        JNE  B00001       TO RESOLVE OUT OF RG ERROR
        B    @READ01
***     DINC @VARA        INCREMENT THE WORD OF MEMORY AT VARA
B00001 INC  @VARA

***     ST   : :+OFFSET,RAM(@VARA)
L0001F MOV  @VARA,TEMP
        LI   TEMP1,>2000
        BLWP @VSBW
***     BR   READ01
        B    @READ01

* CLEAR - Clear the entire input line
***     $IF @RKEY .EQ. CLRLN THEN
L00006 CB   @RKEY,@CLRLN
        JNE  L00009
***     $REPEAT
***     ST   : :+OFFSET,RAM(@VARA)
        MOVB @SPACE,TEMP1
CLRLIN
        MOV  @VARA,TEMP   SO WE CAN FIDDLE WITH VALUE
        BLWP @VSBW
        DEC  @VARA        PRE-UPDATE END OF LINE
***     $UNTIL @VARA .DL. @VARV  DOUBLE LESS THAN
        C    @VARA,@VARV  UP TO AND INCL FIRST POS
        JHE  CLRLIN
***     DINC @VARA
        INC  @VARA        UNDO LAST SUBTRACTION
        CLR  @ARG+4
        MOVB @H00,@ARG+4  INDICATE CHANGE
***     BR   READL2
        B    @READL2      RESTART EVERYTHING
***     $END IF

* GENERAL EXIT POINT
***     $IF @RKEY .NE. CHRTN THEN
L00009 CB   @RKEY,@CHRTN ONLY REACT ON CR/UP/DOWN
        JEQ  L0000A
***     $IF @RKEY .NE. MVUP THEN
        CB   @RKEY,@MVUP
        JEQ  L0000A
***     $IF @RKEY .NE. DOWN GOTO READ$1
        CB   @RKEY,@DOWN
        JEQ  L0000A
        B    @READ$1
***     $END IF
***     $END IF
***     $IF @VARA .DEQ. @ARG+2 THEN  DOUBLE EQUAL
L0000A C    @VARA,@ARG+2 CHECK FOR BLOCK ON LAST POSITION
        JNE  L0000B
***     $IF RAM(@VARA) .NE. : :+OFFSET THEN
        MOV  @VARA,TEMP
        BLWP @VSBR
        CB   TEMP1,@SPACE  BLOCKED?
```

(Please turn to Page 30)

GPL READLN

(Continued from Page 29)

```
       JEQ  L0000B
***    DINC @VARA
       INC  @VARA          POINT BEYOND LAST CHAR IN LINE
***    $END IF
***    $END IF
L0000B RT                  ENTER THE CURRENT LINE
***    $END IF (THIS IS FROM THE $IF THAT CHECKED FOR CTRL CODES)

* INSERT ROUTINE *
***    $IF @ARG+8 .NE. 0 THEN INSERT
L0000C CB   @ARG+8,@H00   INSERT MODE
       JEQ  L0000D
READ04
***    DST  @VARA,@ARG
       MOV  @VARA,@ARG    USE ARG AS TEMP FOR INSERT
***    $WHILE @ARG .DH. @ARG+6
L0000F C    @ARG,@ARG+6   MOVE EVERYTHING UP TO CURSOR LOCATION
       JLE  L0000E
***    DDEC @ARG
       DEC  @ARG          COPY LOWER LOCATION TO HIGHER ONE
***    ST   RAM(@ARG),RAM(1(ARG)) GO FROM HIGH TO LOW IN VDP RAM
       MOV  @ARG,TEMP
       BLWP @VSBR
       INC  TEMP
       BLWP @VSBW
       JMP  L0000F
***    $SEND WHILE        TERMINATOR FOR WHILE
***    $IF @VARA .DL. @ARG+2 THEN
L0000E C    @VARA,@ARG+2  ONLY UPDATE VARA AS UPPER
       JHE  L0000D
***    DINC @VARA
       INC  @VARA         HASN'T BEEN REACHED YET
***    $END IF
***    $END IF
***    ST   @RKEY,RAM(@ARG+6)
L0000D MOVB @RKEY,TEMP1   DISPLAY THE CHARACTER
       MOV  @ARG+6,TEMP
       BLWP @VSBW
***    CLR  @ARG+4
       MOVB @H00,@ARG+4   INDICATE CHANGE IN LINE
READ05
***    $IF @ARG+5 .DEQ. @ARG+2 THEN
       C    @ARG+6,@ARG+2 HIT RIGHT MARGIN?
       JNE  L0002F
***    CALL TONE2         CALL ANOTHER GPL ROUTINE IN THIS CASE BONK
       MOVB @H00,@STATUS CLEAR THE STATUS BYTE BEFORE ACCESSING GPL
       BLWP @GPLLNK       GIVE A BAD RESPONSE TONE
       DATA >0036
***    BR   READ$1
       B    @READ$1       STAY IN CURRENT MODE
***    $END IF
***    DINC @ARG+6
L0002F INC  @ARG+6        UPDATE CURRENT ADDRESS
***    IF @ARG+6 .DH. @VARA THEN
       C    @ARG+6,@VARA CHECK FOR LAST NEW HIGH LIMIT
       JLE  L00010
***    DST  @ARG+5,@VARA
       MOV  @ARG+6,@VARA UPDATE NEW HIGH LIMIT
***    $END IF
***    $IF @VARA .DL. >2FE GOTO READ$1
L00010 C    @VARA,@H766
       JHE  L00011        TO FIX OUT OF RANGE PROBLEM
       B    @READ$1       STILL SOME SPACE TO GO
L00011
* This is where we could scroll the screen if needed
* UPDATE POINTERS IF YOU SCROLL *
***    CALL SCROLL        SCROLL THE SCREEN
***    DSUB 28,@VARA
*      S    @H28,@VARA    BACK TO START OF LINE
***    DSUB 32,@VARW
*      S    @H32,@VARW    BACKUP START LINE ADDRESS
***    DSUB 32,@ARG+2
*      S    @H32,@ARG+2   ABSOLUTE HIGH LIMIT BACKS UP TOO
***    DSUB 32,@ARG+6
*      S    @H32,@ARG+6   CURRENT CURSOR POSITION ALSO
***    BR   READ$1
       B    @READ$1       START WITH SOMETHING ELSE

* FORWARD CURSOR MOVE
RFORW
***    CLR  @ARG+8
       MOVB @H00,@ARG+8   LEAVE INSERT MODE
***    BR   READ05
       B    @READ05       USE REST OF LOGIC

* BACK CURSOR MOVE
RBACK
***    $IF @ARG+5 .DH. @VARW
       C    @ARG+6,@VARW CHECK BOTTOM RANGE
       JLE  L00012
***    DDEC @ARG+6
       DEC  @ARG+6
***    $END IF
***    BR   READ01
L00012 B    @READ01

       END
```

GROM READLN

```
*****************************************
* THIS IS A ROUTINE TO DIRECTLY ACCESS *
* THE GROM READLN ROUTINE. USE CALL    *
* LOAD("DSK1.FILENAME") AND CALL LINK  *
* ("DSK1.START") FROM E/A BASIC TO SEE *
* IT BECAUSE OF SCREEN OFFSET.         *
*****************************************

       DEF  START

GPLWS  EQU  >83E0         ADDRESS FOR GPL WORK SPACE

H00    BYTE 0
WS     BSS  >20           MY WORKSPACE
       EVEN

START
       LWPI WS            POINT TO MY WORKSPACE

       LI   R0,>2
       MOV  R0,@>8320     START SCREEN ADDRESS FOR SCAN

       MOVB @H00,@>837C  CLEAR THE STATUS BYTE SO WE DON'T BET AN ERROR
       BLWP @GPLLNK       LINK TO THE ROUTINE IN GROM
       DATA >2A42

       MOVB @H00,@>837C  RETURN TOTHE CALLING PROGRAM ON ENTER
       LWPI GPLWS
       B    @>0070

* YOU COULD HAVE PLACED AN END STATEMENT HERE AND REF'd GPLLNK INSTEAD
* OF USING THIS ROUTINE.
* GPLLNK ROUTINE *

GPLLNK DATA UTILWS,XGPL  VECTOR FOR THE GPLLNK BLWP

UTILWS EQU  >2094
SUBSTK EQU  >8373
FLAG2  EQU  >8349
SVGPRT EQU  >2030

H20    BYTE >20
EVEN

XGPL
     MOVB @SUBSTK,R1
     SRL  R1,8
     MOV  *R14+,@>8304(R1)
     SOCB @H20,@FLAG2
     LWPI GPLWS
     MOV  @SVGPRT,R11
     RT

       END
```

CHIPS—

(Continued from Page 16)

after Aug. 1 of this year.

According to a report in the *Electronic Buyers' News,* the foreign market value, or FMV, ranges from a low of $2.50 for NEC Electronics Inc. to a high of more than $8 for Fujitsu Microelectronics Inc., both for 256-K DRAMs.

Prices for 256K DRAMs had ranged from $2 to $2.50.

The *Electronic News* reports that orders taken before Aug. 1 are exempt from the pact, but only if they are shipped before Sept. 16. After that, Japanese DRAMs will be revalued at the higher FMV regardless of when the orders were placed.

Some industry observers have called the pact an interference with free enterprise. Others have hailed it as increasing the small profit margins in a competitive business.

Provisions of the pact make it likely that the price hikes will be moderated after October, when the Commerce Department is scheduled to issue new FMV estimates.

John Zucker, director of marketing

(Please turn to Page 36)

SUPER 4TH

Upgrade of TI-Forth flush with new features

A complete overhaul and upgrade of TI Forth, SUPER 4TH, is being published and marketed by DataBioTics.

SUPER 4TH, ver. 1.0, is by Jim Wray and Edgar Dohmann of the Johnson Space Center Users Group.

SUPER 4TH is available from Triton, Tenex or any DataBioTics dealer. Suggested retail price is $29.95 which includes two diskettes and a 108-page manual.

Dohmann says that SUPER 4th provides the following features and improvements over TI-Forth:

1. Loads into SUPER SPACE memory. This takes advantage of an additional 8K byte memory area to allow more room for user dictionary space, Dohmann says, and also allows SUPER 4TH to be selected from the start-up menu once it is loaded. Once it is loaded, he says, it will boot faster because most of the kernel remains memory-resident.

2. Hard disk support. He says that SUPER 4th allows a user to store and read screens from a hard disk. More than 3,000 screens can be stored on a 5MB drive, he says.

3. Sound and speech support. New words are added "to allow convenient use of the sound and speech facilities of the TI99/4A," according to Dohmann. He says these words provide facilities similar to those available with Extended BASIC.

4. New words. In addition to the resident and system-screen words from TI-Forth, many new words have been added to SUPER 4TH, he says. They include "some convenient equivalents for standard TI Forth words and some new features" including a decompiler.

5. Memory resident error messages. SUPER 4th can load the error messages into memory when it is booted, he says, improving response and minimizing disk accesses whenever one of these messages must be displayed. Because SUPER 4TH has six disk I/O buffers, he says, five are still available to the user when one is used to store the error messages.

6. Line drawing graphics. Some special character patterns are added to allow graphics to be generated without having to be in bitmap graphics mode, according to Dohmann. He says these special characters are also available in the 40-column editor.

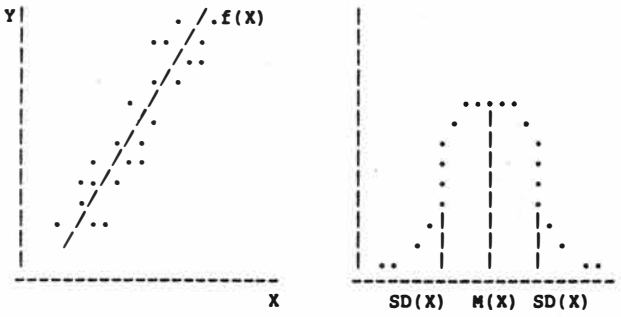
7. Bug fixes. A number of bugs in the TI-Forth system have been corrected in SUPER 4TH, says Dohmann, who says, "Some of these bugs actually trace back to the original fig-Forth model from which TI-Forth was derived."

8. Editor improvements. Both the 40- and 64-column editors have been improved, he says. Autorepeat has been implemented and "some minor changes" have been made to function key assignments to make the editors more like the TI-Writer and Editor/Assembler editors.

(Please turn to Page 36)

NEW ! ! !

STATISTICS PROGRAM



If your work requires estimating, simulating, or projecting relationships among data, this program can be a powerful addition to your T.I. 99/4A library.

FEATURES:

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- runs regressions with up to five predictor variables, plus constant term.
- computes regression coefficients, t-statistics, R-squared, F-statistic and standard error of estimate.
- accepts data from the keyboard, program disk, or other disks.
- very user friendly: 41 screen prompts to guide you, each numbered and explained in detail in the user manual.
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EQUIPMENT NEEDED:

99/4A console, ext. basic, 32k, disk drive and printer.

PROCESSING TIME:

Means, standard deviations, correlation coefficients: about 3 minutes computation time for large data sets.

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GRAPHX vs TI-Artist

No clear winner; each has own strengths

By CHRIS BOBBITT

Maybe it's the sign of a machine with so much to offer or maybe it says something about the priorities of the average 99/4A owner that one can reflect on the fact that until a mere 18 months ago there were practically no graphics programs for the TI-99/4A.

However, in just the past 18 months we have seen a wonderful variety of such programs and peripherals—first Draw-a-Bit and Super Sketch, and later Draw n'Plot, Paint n'Print, GRAPHX, TI-Artist, Joy Paint '99 and the Mechatronics mouse (to name a few). However, at this moment only two programs are contending for the title of the most useful drawing program—all the older programs (such as Draw n'Plot) have been passed by software technology, while newer items like the Mechatronics mouse and Joy Paint '99 are too new to make a fair evaluation (though Joy Paint is developing a loyal following). These two programs are, of course, TI-Artist and GRAPHX.

Both programs have a lot to offer, and both have partisans that claim one is better then the other. It is difficult to get an unbiased opinion. This is not a very good state of affairs, considering that many users are interested in purchasing one or the other, but can't make a decision (which either way could be expensive considering the array of associated products available for both). As one of the authors (and the publisher) of companion programs for both TI-Artist and GRAPHX, I receive numerous letters asking me to judge which is the "best" program. I feel that I have sufficient experience with both programs to state categorically that "it ain't that easy...."

This article seeks to compare the two programs on the basis of eight criteria. After reading it you'll probably agree that your choice of a graphics program will depend primarily on what you want to do with it.

The criteria noted above include the following: Documentation, ease of use for the beginner and the experienced user, value as a creative and a productive tool, functionality and professionalism. On each point, each program will be given a rating of poor, fair, good or excellent, and one will be rated the winner in each category (similar to the ratings provided by Consumer Reports magazine).

Documentation: The clear winner here is GRAPHX. Even though the documentation accompanying version 2.0 of TI-Artist is a giant leap ahead of the disgraceful documentation of version 1.0, it doesn't compare to the instructions for GRAPHX.

The documentation for both programs describes how each individual function works, however, the GRAPHX documentation also gives examples, and is more explanatory than descriptive.

Additionally, the GRAPHX instructions provide detailed explanations of how each function works with brief summaries for the experienced user. The TI-Artist documentation lacks both the tutorial and the summary, and, as a whole, the explanations are more terse and less detailed.

For example, the instructions for the "Copy" command in GRAPHX alone runs two and a half pages, while in the TI-Artist documentation the same function barely rates a half page.

The instructions for GRAPHX also treat hard-to-understand functions, such as the clipboard, with more care and explanation than TI-Artist does for the comparably difficult Slides and Instances.

The documentation for TI-Artist as a whole assumes that the user knows a lot more about the program than does that for GRAPHX, and seems to be designed more for quick reference than anything else. The GRAPHX documentation, on the other hand, is informative while not assuming that the user is an absolute idiot, and is actually quite interesting reading—it is so well written.

Finally, when technical information is compared, GRAPHX is again the winner over TI-Artist. GRAPHX provides detailed information about how files are stored and about various internal variables of the program and less technical information about the limitations of 99/4A graphics. Meanwhile, TI-Artist treats file storage only briefly, and doesn't even mention several file types.

As an bonus, a public domain assembly language utility is provided on the GRAPHX disk for reading in screens and displaying them outside of the GRAPHX environment. No comparable utility is provided for TI-Artist owners. However, as a side note, TI-Artist is still easier to write utilities for (see Expandability below).

On the whole, the documentation for GRAPHX rates as Excellent (among the best for any program), while that of TI-Artist is Fair to Good.

Ease of Use to the Beginner: TI-Artist is a close winner here. Even though the documentation is much less informative than the GRAPHX documentation, the user-interface (that portion of the program that lets the user use all the functions of the program), is considerably better thought out.

TI-Artist uses icons (a la Macintosh) to represent all major functions, and therefore a user can start drawing almost without reading the documentation. Additionally, it is far more likely that the user will recognize how to use

(Please turn to Page 33)

COMPARE—

(Continued from Page 32)

TI-Artist before he does so for GRAPHX. GRAPHX uses text menus for each function which, though effective, require that the user be literate (thus precluding use by younger children). Also, the first-time user of GRAPHX will undoubtedly be disconcerted to see parts of his or her pictures seemingly disappear under menus.

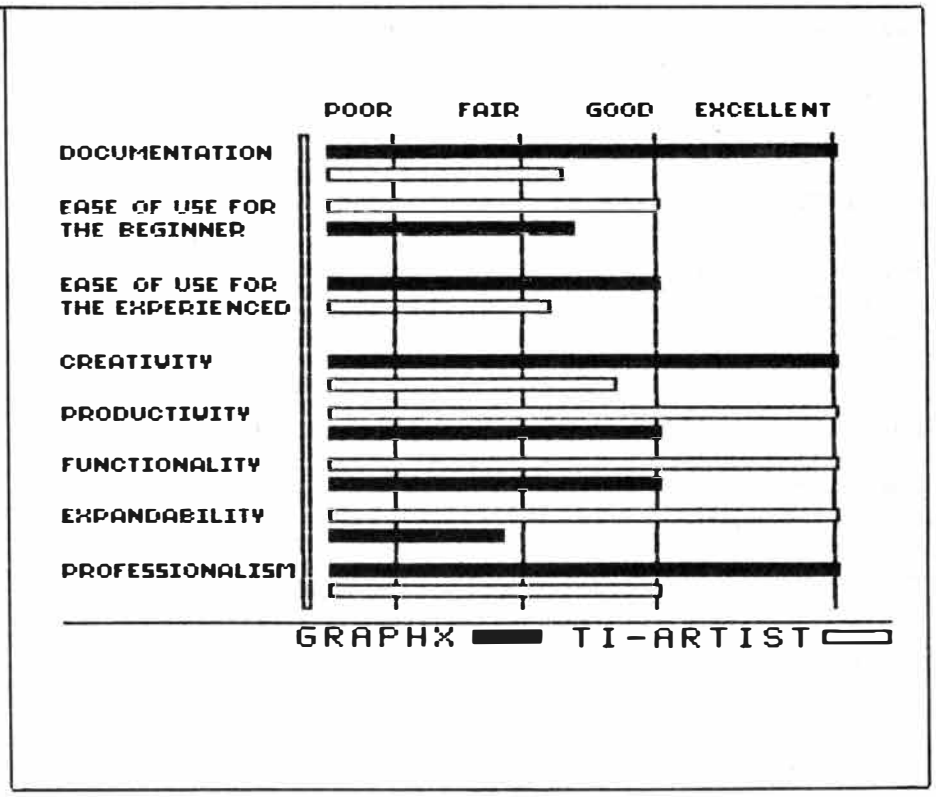
GRAPHX tends to use a tree structure for all functions. While logical, this technique requires more effort to perform a given task. By comparison, all TI-Artist functions may be used directly from one screen. Also, any menu option from TI-Artist can be utilized by pressing a key—a real godsend if you have a stiff TI joystick.

TI-Artist does have some disadvantages, though—if you don't wish to use keys to select functions you will have to move the joystick significantly more than with GRAPHX. Also, some of the icons in TI-Artist aren't very well done, such as that for the erase function.

Yes, GRAPHX has some advantages—the main one being that every function has a small on-screen prompt that tells you what you should do next. And, as indicated above, GRAPHX is better documented, which can mean a great deal to a confused novice user. Since neither user interface is ideal—both have drawbacks—TI-Artist is given a rating of only Good while GRAPHX is Fair to Good.

Ease of use to the Experienced User: GRAPHX is a marginal winner of this comparison. This is primarily because of the way it is designed and not because of the way a user can access its functions.

As mentioned, GRAPHX menus are logically arranged, while all TI-Artist functions seem to be arranged randomly. But despite this easier-to-understand design, menus on GRAPHX do appear with painful slowness, and getting a function requires a considerable amount of joystick pushing. Both programs are far from ideal for the advanced user, but GRAPHX is rated higher for one eason alone—speed.



GRAPHX is faster because all of its functions are in one program and reside in RAM, hence the program disk may be removed after loading. Additionally, most GRAPHX functions seem to work faster—lines, circles, the zoom and virtually everything else can be done faster and easier with GRAPHX. This may be because GRAPHX has fewer functions. The program is somewhat simpler in some respects and doesn't require as much work to, say, type text on the screen or move something. Finally, the time you lose with GRAPHX in working your way through menus you easily regain many times over in waiting for the TI-Artist function you want to load. (TI-Artist consists of several programs which are loaded into RAM when needed.)

TI-Artist does have one speed advantage in that once a particular section is loaded, you may simply press a key to use a function. But, there are so many keys and functions that this can be as impractical as Draw-a-Bit—a program that was completely key driven—was.

On a more basic level, GRAPHX also has a feature every drawing program should have—a variable speed cursor. For the experienced user this means significantly less re-drawing (fewer mistakes are made when the cursor goes as fast as you want it to). TI-Artist, unfortunately, is without such a simple device and suffers because of it.

Also of interest to the experienced user is the fact that GRAPHX is relatively unprotected. It may be copied with virtually any disk manager, and it is assured to work with virtually any disk controller or RAM-disk peripheral. To be fair, Chris Faherty (author of TI-Artist) apparently went to great effort to make his protection compatible with Myarc equipment (as well as TI and Corcomp), but if your original should fail you'll still have to send it back or spend another $20 for another copy. With GRAPHX, if you didn't make a backup copy, well, it's a long way to Australia.

Because of its significantly greater speed, GRAPHX is rated Good, while

(Please turn to Page 34)

COMPARE—

(Continued from Page 33)

TI-Artist rates a little better than Fair because of the slowness involved in going between program segments. Not even a RAMdisk alleviates this problem.

Creativity: This criterion is perhaps the most controversial, especially when I state categorically that GRAPHX is the winner hands down. "How can this be so when TI-Artist has so many more functions than GRAPHX?" the TI-Artist partisan will ask. The answer follows.

It doesn't matter how many functions a drawing program has. What matters most is how effective the program is in allowing the user to draw. Putting aside the many specialized functions supported by TI-Artist, those functions that are shared by both programs are slower in TI-Artist. TI-Artist is far more tedious to use for this reason in the zoom function, the circle function, the cursor speed, the move/copy function and the clipboard.

The zoom function is perhaps the most important creative tool. Users of these programs soon find that they spend much more time in "zoom" mode than any other. Ideally, the user zooms in on a small part of a picture to make a small change, jumps out of zoom to see how the whole picture looks and then zooms in again to make more changes. TI-Artist's zoom is painfully slow while GRAPHX's zoom is nearly instantaneous. Even though most TI-Artist functions are usable in the zoom mode (unlike GRAPHX), the most common use of the feature is simply to erase extraneous pixils, or to do detailed work. Moving in and out of zoom mode in GRAPHX is so effortless that it doesn't matter that you can't do a circle in zoom mode. This is the first strike against TI-Artist as a creative tool.

Cursor speed is also important to creativity. GRAPHX gives you five speeds, ranging from very slow to fast. These speeds are the rate at which the program responds to information from the joystick. The GRAPHX user can put the cursor in a very slow speed in order to draw detailed items with great precision (in the zoom or regular screen mode), or in a very fast mode to draw lines quickly. The TI-Artist owner has to content himself with one speed—one which is too fast for detailed work and too slow for drawing lines or filling small spaces.

Circles are important to creativity as well. The GRAPHX circle function is superior to the one in TI-Artist. In GRAPHX the circle may be bent into any elliptical shape and moved anywhere on the screen before being "dropped" in place. TI-Artist permits only true circles, and once the size is determined they cannot be moved. An artist often reduces figures into ellipses and circles before drawing the detail work in order to get "natural" form—with TI-Artist this is very difficult if not impossible.

Being able to move and copy pieces of the screen is essential to creativity. The fact that the move/copy function of GRAPHX is built into the drawing program, and doesn't have to be loaded separately, is the main reason why it is superior to TI-Artist. TI-Artist permits you to move or copy an area of any size or shape (unlike GRAPHX which has fixed copy windows), but the fact that you have to load a separate program to do this stifles creativity. An artist can't move or copy something at whim. He or she has to plan each move or copy carefully. In other words, TI-Artist reduces an artist's ability to experiment easily.

The programs implement the copy function differently, and there are advantages to each: GRAPHX allows multiple copies and is faster, while TI-Artist permits you to copy any size and test the effect the copy will have before it is dropped into place.

The clipboard function is one of the most useful creative tools unique to GRAPHX. Arguably, the Instances and Slides features of TI-Artist are better for storing clipart, and the Font section of TI-Artist is much better then the GRAPHX clipboard for storing fonts, but what it boils down to in creativity, again, is having the tools where you need them when you need them.

The GRAPHX clipboard is built into the main program and allows you to store a relatively large portion of the screen (about one-third) in color or monochrome. One of its uses is as an area where you can quickly and easily place extraneous art from your current masterpiece—it can function as a type of trash can where you can get what you erase back if necessary. Also, it can store a wide range of clipart of various sizes which can be easily and quickly pulled into your current work. The fact that it also supports primitive font capability (which takes more work than TI-Artist to do roughly the same thing) is icing on the cake. To do any of this in TI-Artist entails leaving the drawing area totally and moving to a different program. After doing this you then have to reload the drawing portion of the program into RAM to continue your work. Again, even with a RAMdisk this is very time consuming.

GRAPHX is so oriented towards creativity that it even features an option allowing you to place a grid of gray boxes underneath the picture. This is extremely handy for centering pictures and text, among other things.

GRAPHX rates Excellent as a creative tool. TI-Artist rates Fair to Good, primarily because all of the major functions are there, though not accessible from the main program.

Productivity: What GRAPHX is to the creative process TI-Artist is to productivity. TI-Artist allows you to produce flyers, charts or ads much quicker than GRAPHX does, provided that the art is pre-drawn.

The fonts section of TI-Artist is better thought out than the similar GRAPHX function. To use fonts on GRAPHX the user must save each letter into a page on the clipboard file. A font 24 pixils tall (about ¾" on a 13-inch TV), with upper- and lowercase letters and numbers will take up

(Please turn to Page 35)

COMPARE—

(Continued from Page 34)

2-3 files. By comparison, TI-Artist will permit all of that in little more then a single file. Moreover, using a font with TI-Artist is merely a matter of typing in a text string, whereas on GRAPHX the user must leaf through a file containing all the letters, and then individually "paste" a copy of each letter where desired on the screen, a potentially tedious task with more than a few words of text.

Using prepackaged Slides and Instances (small and large pieces of clipart), and pre-drawn fonts, the user can create an ad, flyer or any other printed work very quickly with TI-Artist. Also, TI-Artist permits a much wider range of print functions than GRAPHX, and is compatible with a greater variety of printers.

The only problem with TI-Artist as a productivity tool is in creating the fonts and clipart. Fonts cannot be drawn letter by letter and stored; the decimal numbers that represent the hexadecimal codes that represent the patterns must be typed in using TI-Writer or Editor/Assembler editor. Also, these codes must conform to a particular structure or they are meaningless to the program. Creating a new font with TI-Artist can be a nightmare unless the user utilizes a program called Character Sets and Graphics Design (CSGD). CSGD is an Extended BASIC character generation program that creates files compatible with TI-Artist. With a joystick, CSGD allows you to draw letters one by one and then save them as part of a single file. A large library of these fonts is available (many by users of CSGD), and most are sold as part of a companion program for TI-Artist.

Creating clipart on TI-Artist is as difficult as creating any small pictures on TI-Artist. These problems were previously addressed.

GRAPHX has minimal font capability, and companion programs are available from several companies (including mine) that utilize the clipboard's clipart and font capabilities. But, for productivity purposes, TI-Artist wins hands down with an Excellent. GRAPHX still rates Good, and is a considerably better tool for creating fonts and clipart in the first place.

Functionality: TI-Artist is again the winner with no question. The program simply has many more features then GRAPHX.

TI-Artist permits a wide range of patterns for filling figures (useful for signs, though an artist might deny their usefulness in artworks), allows many different types of brushes for drawing (ditto), a box function, a mirror-image function, an inversion function and those wonderful Instances that let you take any piece of the screen and save it as a file. All of this GRAPHX lacks. Also, TI-Artist supports a much wider range of printers and printing methods. Unless you own an Epson or compatible printer you can't print anything with GRAPHX.

The usefulness of all of these functions, except the Instances and the printout options, can be argued, but the mere fact they are available makes TI-Artist superior in this comparison. Because GRAPHX implements some functions better and with more thought then TI-Artist (like the zoom, the circle, etc.), it earns a Good rating. But the fact that TI-Artist has more features then any other drawing program makes it Excellent in this regard.

Expandability: In this comparison TI-Artist excels GRAPHX. TI-Artist is designed so that utilities may be easily written for it, and so that new drawing devices (such as a mouse or drawing tablet) may be easily interfaced. GRAPHX is not.

Despite GRAPHX's advantage over TI-Artist in the amount of technical information provided, only an assembly language programmer can write utilities for it. This is because of the way that files are stored on disk. GRAPHX stores screens and the clipboard in memory image files, ostensibly to save space and time in loading. However, TI-Artist saves files in a format that can easily be read into BASIC programs. Memory image data cannot be loaded easily into BASIC programs.

Accomplished assembly programmers may also write interfacing programs for attaching new peripherals to TI-Artist. However, a program is provided for using a mouse with TI-Artist. The potential is unlimited, and could even include such devices as a digitizing camera. GRAPHX is limited to a joystick or a trackball without considerable re-writing.

Therefore, TI-Artist gains an Excellent mark for expandability, while GRAPHX gets an almost Fair for at least a good effort (an assembly program is provided and the documentation is quite explicit for an assembly programmer).

Professionalism: GRAPHX is the winner with no contest. It is simply much more professionally executed than TI-Artist in everything.

Not only is the documentation and the packaging more professionally designed (as well it should be for a $10-20 higher price), the whole program is logically designed with everything where it should be. The authors apparently had a plan of how the program should work, and they spent two years making it work correctly.

TI-Artist, on the other hand, looks like Houston, Texas—vast but completely unplanned. Functions appear to be placed where they are not on the basis of functionality, but because they wouldn't fit elsewhere. It looks like a first experiment of a brilliant programmer (which is almost what it is). It isn't a unified program; rather, it is many programs that happen to do everything required and more. Some functions are apparently only half implemented while others aren't very well thought out. The operation of the program is slow and ponderous (as befits its size), and relatively graceless.

However, since TI-Artist does everything it says it will do and more, and because there are precious few professional programmers left in the TI

(Please turn to Page 37)

CHIPS—

(Continued from Page 30)

for Mitsubishi Electronics America Inc., was quoted in *Electronic Buyers' News* as saying that the data used by the Department of Commerce came from the second half of 1985 and did not include such factors as changes in the yen.

Several hardware manufacturers were interviewed as to effects of this.

Jackirae Sagouspe, president of CorComp, says the prices of components for that company are going up.

She says that DRAM chips are important in memory and EPROM is "on almost all our cards.

"We were able to sit down and work with our vendors and negotiate purchases which reflect an increase, but not nearly as high as we could have expected," she says.

Corcomp has been able to do this, she says, "fortunately because we produce on a regular basis and on a higher volume and work with our regular vendors. They had been watching the negotiations very closely and they had been getting feedback from the manufacturers as to what they expected the price increases to be."

Reports were of parts they had been purchasing for $3 going up to from $8 to $15.

Sagouspe notes, "We have secured products at what, although they are increased prices, are still reasonable prices. We have had to pass on the price increases to our distributers and major purchasers. We will leave it to them as to how much to pass on to the consumer."

She notes that the prices under the agreement are still in flux, though they are eventually supposed to be fixed at the FMV by the Commerce Department. She notes that the department was looking at licensing, "trying to keep people from buying masses at low prices."

Sagouspe says that, with the price increases CorComp has set, the company should have "no problem."

She adds, "If we are wrong, we would look at how we could absorb the difference, which would be our first choice. The only other alternative would be to go to a broker, from whom we would have to buy in bulk. If you buy this way, though, you're stuck with any defective parts. Now, we can send back defective parts."

A representative of another hardware company, David Romer of Horizon Computing, says the anti-chip-dumping trade agreement will not affect the price of his company's RAMdisk, because it uses applied CMOS static RAM.

"Myarc and CorComp use the dynamic RAM, which is cheaper," he explains. "We use static because our card has batteries. DRAM wasn't meant for that."

Rick Hakemian of RAVE 99, which manufactures enhanced keyboard for the TI99/4A, says his company has no plans to change prices now.

"We have already purchased most of the parts for a good deal of them," he says. "I don't know how it will affect component prices. Most things we're buying are available pretty commonly."

He adds, "It certainly might affect other things we're working on. It could be that some things we have in mind might be too expensive to bring to market. We haven't seen the final effects of this. If we can't sell it at a reasonable price, we won't sell it."

Hakemian speculates, "Maybe the prices going up may make us more clever in our engineering."

Lou Phillips of Myarc says that Myarc "schedules things out a year in advance, so (the price increase) shouldn't affect us at all."

He adds, "There are huge amounts of excess semiconducter capacity out there, and with the new tax laws, it will be even more of a buyer's market. It's such a slow market now. Perhaps, with the Geneve, we're doing the only new thing. We're one of the only companies doing anything new. IBM PCs aren't new."

SUPER 4TH—

(Continued from Page 31)

9. Optimization. Many words and features of TI-Forth have been optimized for space and speed improvement, he says.

10. Easier loading. The number of load options have been reduced, according to Dohmann, by combining features into consecutive screens. Specific screen location requirements for most load options have been eliminated, he says. He says that the most commonly used features are combined into fast-loading memory images.

11. Printer configuration. The printer device name can be configured on the boot screen, he says, and can be changed easily at any time. He says it is no longer necessary to modify hard-coded word definitions to change the priter name.

Dohman says "every effort" has been made to keep SUPER 4TH as compatible as possible with TI-Forth so that existing applications will require minimal modifications to run with SUPER 4TH. Any TI-Forth applications that have been BSAVEd will have to be loaded from their source screens under SUPER 4TH. Once loaded, they may be BSAVEd once again as SUPER 4TH applications.

The authors say they are grateful for the suggestions and encouragement received from the user community.

Argentine TI group in formation process

A TI99/4A user in Buenos Aires, Argentina, is attempting to form a users group.

For further information, contact Norberto R. Bettinelli, Casilla de Correa 39, 1429 Buenos Aires, Republica Argentina.

COMPARE—

(Continued from Page 36)

world, it has to rate a Good. GRAPHX rates Excellent because there is no higher mark. Whereas GRAPHX looks finished, TI-Artist doesn't.

Conclusion: Both TI-Artist and GRAPHX represent two ways of looking at graphics on the TI99/4A.

Without a doubt, GRAPHX is the superior creative tool. It is truly a breakthrough for the casual artist who wants to create everything from artwork to charts and diagrams. TI-Artist, on the other hand, is a superb productive tool. It is as close to the Printshop genre as the 99/4A world has come. And it combines a wide range of drawing functions to allow the user to do most basic creative work as well.

GRAPHX is superior to TI-Artist in its documentation, implementation and ease of use for the advanced user, while TI-Artist is easier to use for the beginner and is more functional and expandable.

All in all, there is a good case for the purchase of both. The wide array of companion products available for each merely expand the usefulness of each for its particular specialty: GRAPHX for creating new art, and TI-Artist for turning art into something useful. The purchase of either should be determined only after careful consideration of what your own inclinations or needs are.

However, before making any decision you should be cautioned that the graphics story is far from over. The introduction of a Printshop-like program would make TI-Artist obsolete overnight, but GRAPHX would still be most suited for creative pursuits. Correspondingly, the introduction of a MacPaint-like product would remove any use for GRAPHX as well as TI-Artist. Barring the introduction of these products, however, the choice remains yours. What you should get depends entirely on what you want to do.

TI99/4A serves as basis for production of magazine

By LAURA BURNS

A national magazine that uses the TI for its operations doesn't have to be a magazine about the TI.

Witness the sTa Phantom, a magazine for tow truck owners, published monthly in Hyde Park, Massachusetts. Editor Joseph E. Gibney says that a key factor in getting this special-interest publication out are three TI99/4As.

Articles are processed on TI-Writer in 50-character columns and printed out on an SCM. Lately, Gibney says, he has been using BA-Writer. Navarone's Data Base Manager is used to handle subscriptions, list management and subscription expirations.

In addition, Gibney and his wife had compiled a state list on Name-It. This made up about 14 files, he says. "I used Millers Graphics' Advanced Diagnostics disk to show the whole thing as one list and changed it over to the Navarone DBM—then I had the files all attached together on one disk.

The magazine has been in business six years. Gibney says they started out putting it out by typewriter. Then, four years ago, he got a TI with cassette tape. "I finally got disk, and I picked up BA-Writer. It's beautiful. It has all the things TI could have done and didn't. Now I leave in the Navarone DBM cartidge all the time and load in the BA-Writer through the Navarone Disk Controller.

Another list maintained is Tow Link, a nationwide list of approximately 2,000 tow truck operators. It is sent to the operators so that "if a customer is traveling in Arkansas he can call a company at home and they can find someone in Arkansas for him. It's sort of a national referral system." He also has another list of 2,000 Massachusetts towers.

He uses an Okidata 2A to print labels, he says.

Also, thanks to his TIs, says Gibney, Massachusetts has "the first tow show in the country on a computer—the rest are (organized) on three by five cards."

Amarillo BBS for TI

Herman L. Green, sysop, announces the Golden Spread Data Exchange, which he says is the first TI bulletin board in Amarillo, Texas.

The BBS number is (806) 383-2270. Green says for assistance call (806) 383-9611. He says the board has "no uploads, just downloads and lots of text to read."

He says the board is operating on three double-sided drives and he hopes in the future to have a double-density controller card.

SST Expanded Basic Compiler
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With Graphics and Text Mode
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REVIEW - The Compiler received an excellent rating for performance and documentation in a review in the HOME COMPUTER MAGAZINE, Sept., 1984.

The Compiler translates Basic programs into TMS 9900 machine language. It contains most of the features of Extended Basic plus many others. Requires memory expansion, disk, E/A or MM module.

PRE/SST PROGRAM - $30.00
Facilitates preparing existing programs for processing by the SST Compiler. Makes developing new programs easier. Requires extended Basic and memory expansion.

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Cedarburg, WI 53012

Mechatronic 128K GRAM card

German card unlocks TI power

By MACK McCORMICK

The 128K GRAM Card from Mechatronic is an exceptional piece of hardware which enables all cartridges to be saved to disk and later loaded and executed from the GRAM card. In fact, I've permanently stored all my cartridges away. Now every cartridge I own resides on one of my hard disk drives ready for instant access. I personally visited the Mechatronic firm and found their facilities to be modern and efficient. The people are very courteous and friendly, which certainly makes business dealings great.

Performance: The card works perfectly as advertised. I tested dozens of cartridges and found that all performed just like the original. Even the bank-switched cartridges, such as Q*bert and Frogger, worked perfectly. However, the Milton Bradley MBX cartridges will not work due to their unique bank switching scheme. I did notice an occasional problem with some multiple GROM cartridges not loading correctly on the first attempt (Extended BASIC, for example). This was by far the exception rather than the rule. I'm sure some data error correction mechanism in the loader could be devised to completely eliminate this minor problem.

The card is completely transparent to the user. The card stays tucked away in the expansion box with no switches to flip: Out of sight and out of mind. It's like my computer has built-in Extended BASIC and Editor/Assembler. When a cartridge is inserted into the console the GRAM card switches itself out of the system automatically.

When the computer is initially powered up the card executes a brief RAM initialization routine which takes about two seconds before the normal power up screen appears. Up to two separate cartridges may be loaded at any one time, although with the 512K version (available soon) this limit is greatly expanded. The German users here have devised several multiple cartridges to overcome this limitation. For example, one such cartridge includes Editor/Assembler, TI-Writer, a disk copier and a debugger all in one. Really impressive! Of course, you may add a second GRAM card if you desire.

Review

Report Card

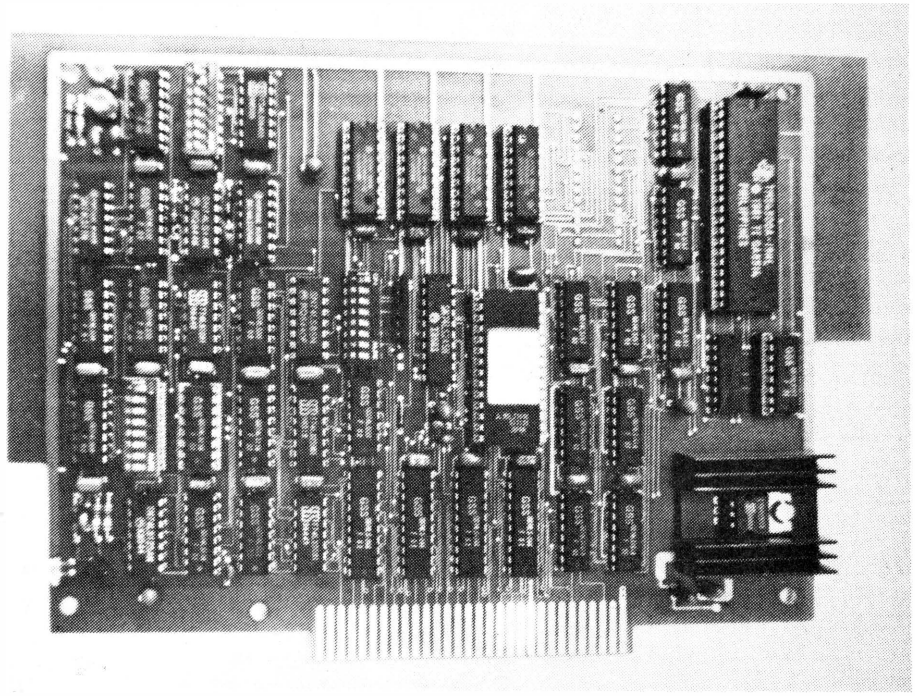
Performance.....B+
Ease of Use.....A+
Documentation.....A
Value.....A
Final Grade.....B+

Cost: U.S. $249.50
Manufacturer: Mechatronic GmbH, Sindelfingen, West Germany
Distributer: T.A.P.E Ltd., 1439 Solano Place, Ontario CA 91764
Requirements: console, TV or monitor, disk system, Peripheral Expansion Box.

There are two features I would like to see added to future versions of the card. First, I would like to see battery backed CMOS RAM or a jack for a wall transformer to retain the cartridges when the expansion box is turned off. Secondly, this version of the card does not have the capability to modify the console RAM from 0000 to 2FFF. For those of us who would like to modify the console routines, this would be most helpful. You can modify console GROMs 0 and 1, though. (According to Franz Wagenbach, Mechatronic's North American distributor, newer versions permit console RAM modificaton at the above addresses—Ed.)

Another feature which I thought was particularly useful is the ability to address the card using DIP switches at any CRU address. This prevents conflict with existing hardware (for example, in my system I'm running out of CRU address space). In short, the card performs exactly as described in the manual with no serious bugs.

(Please turn to Page 37)



GRAM—

(Continued from Page 38)

Ease of Use: As I have already mentioned, the 128K GRAM Card is easy to use. In fact, after only a few moments, you don't even notice the card is there.

After the title screen appears and you press any key to proceed you are presented with a menu which has the selections "2-FOR GRAM CARD "9800" and "3-REVIEW MODULE LIBRARY." Boy, was I ever excited the first time I saw the "Review Module Library" selection as I knew it existed in the computer software but never had seen it implemented. When you press "Review Module Library" it takes you to the next bank of GRAM in the card automatically so you may load a second cartridge at GRAM address >9820. When you press "For GRAM Card 9800" you are presented with a screen which has an option of the loader for cartridge management and eight of the most common modules, such as Extended BASIC, Editor/Assembler and TI-Writer. By pressing FCTN 8 you are presented with eight more selections for loading.

You are by no means limited to being able to load only 16 cartridges because when you enter the loader you may load any cartridge. For example to load Editor-Assembler all one must do is press selection 3 "DSK1.EA" and the card looks to disk drive one for the file, loads it automatically, and returns you to the main title screen. Using a RAM disk or hard drive this process takes less than 2 seconds. From disk it requires about six seconds. That's just how easy it is to load a cartridge from disk.

The LOADER feature is exceptionally easy to use. The LOADER allows you to LOAD (G)RAM WITH PROGRAM. This allows you to load previously saved cartridges one RAM or GRAM bank at a time if desired. Option 2 (LOAD GRAM WITH ASSFILE) allows the user to load one's own tagged object code GPL program. I have used Michael Weiand's GPL assembler (reviewed in August 1986 MICROpendium—Ed.) and written my own GPL program for loading here. It was great fun to be able to write and assemble my own GPL programs. I finally felt like TI no longer held anything over my head.

Option 3 (LOAD RAM WITH ASSFILE) allows you to load tagged object code assembly language programs into the address space from >6000 - >7FFF. This is similar to any of the cartridges on the market with RAM at this space but is a very useful feature which doesn't require a cartridge in the port.

Option 4 (LOAD GROM 0-2) copies the GROM address space from >0000 ->57FF in the console to the GRAM card. This guarantees you have a good copy, and allows you to go in with the built in editor and make modifications.

Option 5 (SAVE GROM) is the feature used to save the GROM in a module to disk. Option 6 (SAVE ROM) allows you to save the ROM in a cartridge to disk. One unique aspect of this feature is the ability to switch to another bank automatically in the cartridge. For example, in Extended BASIC the ROM is flipped at address space >7000 ->7FFF.

Finally, Option 7 (LOAD-FILE) allows you to load all GROMs and ROMs automatically with a single file name. The file looks to a display variable 80 file you create with BASIC, TI-Writer, or Editor-Assembler which contains the file names of all the individual GROMs and ROMs you previously saved using options 5 and 6. Once you set up your cartridges, there is never a need to modify this file again.

There are also two great features available from any BASIC command level. The first is CALL GRAM, which calls up the loader menu previously described. The second is CALL EDITMEM, which calls up a full-featured memory editor allowing you to edit either ROM or GROM files in the GRAM card. This allows simple modification of cartridges. The book *TI Intern* by Heiner Martin is a source listing of the ROM and GROMs in the console with a brief explanation of GPL. It is a great aid when modifying code.

Resetting the card is also a snap. Simply press FCTN Quit and while the computer is resetting press FCTN Clear.

An extraordinary feature I found is the ability to load a BASIC program you have written and have it displayed on the title screen and executed as though it resided in a module. You simply enter CALL MODUL("DSK1.MYNAME").

From a hardware standpoint the card is well constructed and professionally laid out. There are DIP switches that allow you to modify the GRAM base address in the card. This would be necessary if you used multiple cards. The default addresses are >9800 and >9820. There are also DIP switches to allow modification of the CRU base address for the card to prevent conflict with other cards in the expansion box. The default address is >1700. In summary, it is an exceptionally easy piece of hardware to use.

Documentation: The manual for the card is well written and easy to understand. In fact the original version I used was written in German. In spite of my limited ability to read German, I was using the card with no problems within minutes. Each feature is fully explained with clear examples provided. A memory map of the RAM organization in the card is provided for the advanced programmer's use. Also provided for the advanced programmer is a listing of all CRU bits used by the card and their function. I found this to be somewhat unusual for a hardware developer yet most welcome. The manual also provides a listing of all cartridges and the GROMs and ROMs they contain to make copying them easier. Several examples of program modifications are also provided. The manual answered my questions about the card as well as serving as a reference.

Another advantage lies in the fact

(Please turn to Page 40)

Newsbytes

DOS to market MPB board kits

Exclusive marketing rights to the "MPB Clock and Analog to Digital Printed Circuit Board" by MPB of Wichita, Kansas, have been granted to Disk Only Software of Rockville, Maryland.

The MBP board has been available to the TI community for some time. Disk Only Software (DOS) President Jeff Guide says that an effort will be made to get members of the TI 99er community who have never put together a board before to give it a try. "We feel that the board is simple in concept and easy to build," Guide says.

According to Guide, previously the board has appealed largely to those interested in creating a bulletin board system (BBS). However, Guide says he has already approached software houses and authors about developing new or enhancing existing software products to take advantage of the board features. Initial reactions have been enthusiastic, he says.

Guide says he wants all software authors to know he is in the market for both ideas and products.

MBP has suggested the use of the board for such products as an appointment calendar that determines the day, the week, or the month and searches a file to display appointments for the user. Birthdays and anniversaries could be displayed, along with bill due dates.

Event recording, a form of automated diary helpers, is possible. Output scheduling and financial analysis programs, disk lists, and other applications would benefit, according to MBP.

Users with a good command of assembly language might be able to tackle the modification of their own personal copies of Multiplan or TI Writer, according to the manufacturer. An automatic download stamp would reduce confusion in sorting files acquired from bulletin board services or electronic user forums.

Two important steps are immediately being taken to make the board marketable to the TI community, Guide stated. Complete instructions on the construction of the board would be made available at a low cost. Interested persons can now study how to construct the MBP board without actually purchasing it. For the purchase price of $4 the user will receive complete assembly documentation.

This complete documentation includes the telephone number of a BBS run by the makers of the board on which the user can contact other users and the board developers. If after studying the instructions the person decides not to construct the board, Guide said, DOS will build the board or give the book buyer merchandise credit if desired. The return of a saleable instruction book would earn the buyer the credit.

DOS will also market the parts needed to complete the kit, previously left to the purchaser of the board, "taking a lot of uncertainty out of getting started," Guide said.

The instructions can be purchased for $4 and the board will be availble for $49. The price of the parts is yet to be determined, Guide said.

DOS will undertake to sell or list usable software generated by authors, he said.

While both MBP and DOS advise that a group is the best way to complete such a project, they say that individuals can do it.

For more information, contact Disk Only Software, Post Office Box 4170, Rockville, Maryland 20850, or phone (301) 369-1339 or toll-free at 800-446-4462 + 897335 at the tone.

Purchases may be made through the toll-free number or by going to Page TDG-44 on CompuServe.

Tenex fall catalog out

Tenex Computer Express has published its fall catalog, "The Everything Book" for the TI99/4A.

For a copy, call 1-800-348-2778 or (219) 259-7051 or write Tenex, P.O. Box 6578, South Bend, IN 46660.

GP-100TI-compatible program announced

Bob Stahl of Hummels Wharf, Pennsylvania, announces that he has a program for the GP-100TI which will print a TI-Artist or GRAPHX screen.

Stahl is not associated with the companies that wrote the graphics programs and wrote the program to help three users in his area.

He wrote MICROpendium in response to Arthur Hazboun's letter in the July issue.

The program requires expansion memory, one disk drive and the Editor/Assembler module. Stahl says the program will also work with the Gemini 10X/15X printer and that he is working on a version for the Prowriter. He says the program may be kept on the same disk as the screens. He describes it as a fast assembly language program that allows the user to load and view or print many screens in a short period.

To obtain the program, send printer type (Gemini or GP-100TI), one disk and $10 with SASE/mailer to Bob Stahl, P.O. Box 430, Hummels Wharf, PA 17831.

He notes, "If you still have problems printing a screen, send it back with a photocopy of your printer codes

(Please turn to Page 42)

GRAM—

(Continued from Page 39)

that the GRAM card is hidden away in the expansion box.

This card is everything it is billed to be. I have thoroughly tested it and found it to perform exceptionally well. I am sure if you decide to purchase one you will be satisfied for years to come while at the same time opening a whole new dimension to your computing.

MegaRam™ from ATRONIC

The only **full** megabyte (1024k) RAM memory expansion for the 99/4A has now been introduced in North America. This new stand-alone unit attaches to the I/O connector to add the standard 32k PLUS 992k of extra memory. The innovative "SUPERVISOR" program monitors memory use, RAMDISK functions and bank-switching for application programs. MegaRam works with XB or E/A languages and other TI modules which require 32k. Compatible with virtually all TI programs. MegaRam does not come as an Expansion Box card due to the direct address line access needed. Price: $575.95 (US) for twice the memory in this astounding product! Requires console, drive, XB or E/A.

MULTIFUNCTION CARDS: Another first in the TI 99/4A community. DS/DD Disk Drive Controller with 32k memory on board. Controls up to four drives. Based on TI specifications. Frees up an extra slot at lower cost compared to separate Cards. Fully compatible with all tested software. Price: $265.95 (US funds).

RS-232 with 32k memory on board. Two serial ports and one parallel port. Works like TI's RS-232 card except that the parallel port is not bi-directional. Gives you more room in your PE box. Price: $175.95 (US).

Super Clock Support

Designed for the CorComp Clock Peripheral—Triple Tech Card or Stand-alone models. This utility package provides more functions for use in your Extended Basic programs. Direct access to the clock ROM at assembly speed gives you these features: three independent timers to set and read; alarm function; two interrupt routines to display time and date on screen with CTRL T—continuously or on your command; all time and date displays are in 12 or 24 hour format using **TEXT.** This program also allows the week, date and time to be set independently rather than all together.

Program disk is not copy protected to allow you full use in your Extended Basic programs. Package includes disk and instructions. Only $17.95 plus $2 shipping (US funds).

BASIC Compiler V1.1

New Basic Compiler that is finally easy to use! Supports virtually all Basic and Extended Basic commands in existing programs. Simply load and compile programs from a menu driven directory on your screen. No extensive re-writing, variable declarations or conversions are required. Compiler produces code-list in one pass containing all variable addresses and jump list. Package includes Extended Basic Loader, Floating Point Loader, Integer Loader, Disk Menu program and DSR program for the Compiler support. This Compiler cannot unravel DEF statements and stops on the END statement—no SUB's allowed. TRACE, BREAK, ON ERROR, CALL LOAD and CALL LINK may produce execution errors. Requires 32k, disk. Price: $20.00 plus $2 shipping (US funds).

XBII plus

As reviewed in Micropendium October 1985. This command module gives you all the features of Extended Basic PLUS 40 new commands. Totally compatible with TI's XB, this enhanced version gives your programs more power to access your 99/4A. Commands such as MLOAD, MSAVE, VPEEK, VPOKE, GPEEK are superior to most other Basic environments. Various demo programs and new applications using high resolution graphics make this module a "must" for Extended Basic users. Comes complete with a 95 page manual. Requires console and 32k. $75.00 (US) plus $2 shipping.

ENHANCED GPL Assembler V2.1

NØW with high memory loader package

This package includes the GPL Assembler disk, printed documentation, GPL tips and hints, update support service and commented GROM/ROM listings (with the book "INTERN"). An example for a command module type GPL program is included with source, object and list files on disk.

Requires: 32k memory, disk drive(s), TI Editor Assembler package. Printer/RS-232 recommended.

Price: $59.95 Package w/ INTERN $75.00 (US)
Add $3 S & I.

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Newsbytes

(Continued from Page 40)

and I will see if it can be made to work."

Bowling program set for mid-October

Pilgrims' Pride software announces Bowling League Secretary.

The company is the exclusive manufacturer and distributor for the program, which is expected to be available in mid-October.

Tentative price is $39.95.

Scott O'Gorman of Pilgrims' Pride noted that the program has a facility in it to accommodate those who wish to begin to use it after the bowling season has begun.

For further information, contact Pilgrims' Pride, P.O. Box 2, Hatboro, PA 19040 or (215) 441-4262.

Myarc, CorComp on show at Faire

Myarc's new Geneve computer and CorComp's Powerhouse X-10 home controller will be among the products demonstrated at the Chicago-Area TI99/4A User's Group's fourth annual TI99/4A Computer Faire Nov. 1 at Triton College in River Grove, Illinois.

Vendors who have acquired booth space at this years' Faire include Asgard Software, Rockville, Maryland; C and G Drives, Northbrook, Illinois; Competition Computer, Milwaukee, Wisconsin; Data Systems, Oxnard, California; Databionics, Greenfield Wisconsin; DataBioTics, Diamond Bar, California; Great Lakes Software, Howell, Michigan; Horizon Computer Ltd., Wallbridge, Ohio; Hunter Electronics, Elmhurst, Illinois; L.L. Conner Ent., Lafayette, Indiana; Micro Format, Prospect Heights, Illinois; Tigercub Software, Whitehall, Ohio; and Ryte Data, Haliburton, Ontario.

The Faire will be held from 9 a.m. to 6 p.m. in the Ironwood Room of Triton's Student Center. Triton is at 2200 N. 5th Ave. in River Grove, ¼ mile north of Maywood Park race track.

Admission is $2 and includes admission to seminars.

For more information write to the Chicago-Area Users' Group, Attn: Faire Committee, P.O. Box 578341, Chicago, IL. 60657, or call Grant Schmalgemeier at (312) 477-0690 between 10 and 11:30 p.m. Central Time. Motel reservations close to the Faire may be made by calling Thomas Kaar at (312) 579-0072 from 4:30 p.m. to 10 p.m. Central Time.

Foundation card gets support from Myarc

Myarc has an Eprom for the Foundation RAMdisk which allows it to use Myarc's XBII, according to Lou Phillips of Myarc.

Phillips says this was developed for owners of the Foundation card and is sold "on an as is basis. We do have one card and it works with that."

He notes, however, that it would be difficult to determine whether any problem that arose was in Foundation's product or Myarc's.

He says that Myarc is also getting a demo from Inscebot of an interface with TI-Artist which can draw graphics and run graphics in a program.

For further infomation, contact Myarc at P.O. Box 140, Basking Ridge, NJ 07920 or (201) 766-1700.

New TI Artist version

TI Artist, version 2.01, which incorporates a few extra features "for convenience and loading efficiency," is now being shipped to dealers and distributors, according to Steve Lamberti of Texaments.

He says that unlike version 2.0, TI Artist 2.01 is now entirely file-based and can reside "on nearly any mass storage peripheral device. With the addition of a path generation program TI Artist may be configured and reconfigured any number of times to be run from any device."

Such devices include Myarc's 128K or 512K cards, Myarc's hard disk system and New Horizon's RAMdisk, according to Lamberti.

Other additions he listed include the ability to erase pattern or color portions of a picture from within the Enhancement mode, and compatibility with Axiom GP-100TI and Axiom GP-550A printers.

He says all current TI Artist owners may obtain the 2.01 update by sending their original program disk, sales receipt and a fee of $5 to Inscebot, P.O. Box 260, Arnold MD 21012. Persons who have purchased TI Artist since May 1 may obtain the update free of charge. The manufacturer asks that users include their printer type with their 2.01 update request.

For additional information, call Texaments at (516) 475-3480.

PROJECTFILES for auditor program

PROJECTFILES is a series of programs for use with PRK DataBasics' PERSONAL AUDITOR. The program is also from PRK DataBasics.

According to the manufacturer, PROJECTFILES will allow global deletions of specified records by date or name field entries or global replacements in date, name or budget category fields.

The manufacturer says PROJECTFILES allows the PERSONAL AUDITOR owner to design a project encompassing up to a 12-month period that will select, save to disk and summarize to printer each subfile specified in the project. Processing is automatic, the manufacturer says, and either single or double disk systems are supported with no disk swapping involved.

Purchased together, PERSONAL AUDITOR and PROJECTFILES retail for $29.95 plus $2 shipping and handling. PROJECTFILES may also

(Please turn to Page 43)

Newsbytes

(Continued from Page 42)

be purchased by current PERSONAL AUDITOR owners for $10 plus $2 shipping and handling. The programs are available from PRK DataBasics, Box 2642, Grand Junction, CO 81502.

North Eastern 99ers to hold workshop

The North Eastern 99'er Computer Club will hold its Second Annual Computer Workshop from 10 a.m. to 4 p.m. Oct. 11 at Jenks Junior High School in Pawtucket, Rhode Island. Admission will be $3, or $2 with advance ticket.

The event will include product demonstrations, including hardware demonstrations from Corcomp, Millers Graphics, Horizon Ramdisk, and Myarc. Software demonstrations will include TI Artist, Graphx, Brain and Funlwriter. Help sessions are also planned throughout the day on topics including TI-Writer, Multiplan, data bases, Forth, disk maintainance and repair, telecommunications and Assembler.

The new Geneve computer is scheduled to be demonstrated by Myarc representatives.

For more information contact North Eastern 99'er, c/o Bob Levetin, 74 Grove St. Plainville, MA 02763 (Source-TI5278, CompuServe-73267,101).

English manual set for 80-column card

Mechatronics of West Germany has sent out its 80-column card, and dealers in North America should have them in October, according to Franz Wagenbach of T.A.P.E. Ltd.

Wagenbach, whose company distributes Mechatronics' products, says dealers will get the cards for sale as soon as the English-language manual is available for it.

He says the card, which runs out of Extended BASIC, the Editor/Assembler or the Mini-Memory, will come with public domain word processing software.

He says that Chris Faherty, author of TI-Artist, has said he plans to rewrite that program for the 80-column card, but that no date has been set for this as yet.

Bruce Ryan of Ryte Data in Canada, one of the firms that sell Mechatronics products on this continent, says that previous plans for Ryte Data to manufacture the card have been cancelled because of concern by the author as to whether this agreement might violate German licensing regulations.

For further information, contact T.A.P.E. Ltd., P.O. Box 4042, Ontario CA 91761 or (714) 989-9906.

Forest Lane users open membership

The Forest Lane Users Group, formerly a closed TI99/4A users group for Texas Instruments employees only, announces that it is now open to all users of the TI99/4A.

Meetings are held at 1 p.m. the first Saturday of each month at the SC Building Cafeteria of the main TI plant in Dallas, Texas.

Richard A. Fleetwood, correspondence secretary and club sysop, says the club is interested in exchanging newsletters with other TI users groups.

He says the club operates a 24-hour TIBBS at 300 and 1200 baud, now running version 5 with Xmodem and TEII transfers. Phone number for the board is (214) 321-4238.

Fleetwood says the system for the BBS consists of two double-sided, double-density drives, two quad density drives, one DS/DD Horizon RAMdisk and a Hayes 1200 baud modem. He says the disk controller card is one that the club produced internally a couple of years ago which has been modified for quad density. The TIBBS program has been highly modified, he says, with multiple menus, seven different download catalogs, 24 line messages, ASCII ARCHIVES and other additions. He says it offers more than 75 different text files, many of which are updated regularly, and more than 130 download files, including public domain and fairware programs.

Fleetwood says all new callers will be verified within 24 hours and then will have full access to all new features, except for the VIP section, which is reserved for FLUG members and for users who have donated to help pay the costs of running the board.

For further information about the group or the TIBBS, contact FLUG, P.O. Box 743005, Dallas, TX 75240.

'Dugout' is Techie BBS

Jim Edwards, sysop, annonunces "The Dugout" BBS, operating at 300 baud from 6 p.m. to 11 p.m. in La Crescenta, California.

The board is a Techie system, written by Monty Schmidt, and features a message base, TI news, an on-line adventure and XModem downloads. The board can be reached at (818) 248-0562.

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User Notes

Screen text dump

Dane Heatherington of Largo, Florida, wrote this subprogram. It dumps text from screen to printer. (It's set up for a Gemini.) Use a GOSUB at the point at which you want the screen to be dumped.

```
1000 REM BY DANE HEATHERINGT
ON
1010 REM LARGO, FLORIDA
1020 OPEN #1:"PIO"
1030 FOR ROW=1 TO 24
1040 FOR COLUMN=1 TO 32
1050 CALL GCHAR(ROW,COLUMN,X
)
1060 PRINT #1:CHR$(X);
1070 NEXT COLUMN
1080 PRINT #1:"
                    " ! (ente
r 32 spaces between the quot
es)
1090 NEXT ROW
1100 CLOSE #1
1110 RETURN
```

Fix for & and @ using TI-Writer

The following comes from Paul Degner's column in the newsletter of the Winnipeg 99/4 Users Group. He credits the information to Terry Atkinson. It's of value to anyone who is tired of having to enter double ampersands and "at" signs in order to print them. (Because TI-Writer uses these characters as formatter controls, they must be entered twice to be used as text characters.)

According to Degner, users can permanently fix this problem by modifying a few bits of code in the TI-Writer FORMA1 file. Using a sector editor, locate the following hex sequence: 23 21 40 26. To replace the ampersand and at signs with a "tick" mark (FCTN C) and back slash (FCTN Z), replace the 40 and 26 with 60 and 5C.

While you're at it, you may want to change the default colors in the formatter. Search the FORMA1 file for the following sequence: 02 00 07 F5. Change the F5 to whatever background color you want. The change the foreground (character) colors, locate the following code: 80 02 01 F5. Change the F5 to your favorite foreground color.

It's best to copy the FORMA1 file to a newly initialized disk before making these changes and then copying it back to your working copy of TI-Writer.

Forth program is corrected

A program in Forth published in the April MICROpendium contained errors in the sort function of the program. The program is designed as a database to locate User Notes from MICROpendium. It was written by Howard H. Arnold. Arnold writes:

Frank Bubenik and Ted Schoblocher have called my attention to a serious problem in using the sort function with large files in the subject program. The following changes seem to fix it.

On SCR 76: Add a new variable - 0 VARIABLE TEMP1 84 ALLOT

Change the definition of SWITCH as follows:

```
: SWITCH RECORD TEMP R-LENGTH MOVE -1 #RECORD +!
RECORD DUP
TEMP1 R-LENGTH MOVE TEMP SWAP R-LENGTH MOVE UP-
DATE TEMP1 1
#RECORD +! RECORD R-LENGTH MOVE 1 SWFG ! UPDATE
#RECORD @ . ;
```

It's a tight fit, but everything still fits on the screen by rearranging the existing definitions on the screen a bit. After editing the screen, FLUSH. Then load by typing:

```
FORGET TOP 76 LOAD
```

Redefine MENU (it's wiped out when you FORGET TOP), by typing:

```
: MENU CLS 272 257 DO 3 SPACES I MESSAGE CR LOOP CR CR
CR ;
```

from the keyboard. The whole thing should now work, and you can save it to the binary file with:

```
' TASK 21 BSAVE.
```

Quik-Vu update

This program, by Erik Olson, was published in the July User Notes section. It is a multi-use program that can be used to catalog disks (floppies, winchesters and RAMdisks), read D/V80 files and delete programs and files from a disk.

We had a problem with getting the program to read winchester directories and Olson has supplied the following solution. He writes:

In line 200 of the listing: Change IF W = 1 to IF W = -1. This is one way to fix the winchester bug.

In line 300 change IF D = 130 to IF D = 250. Looks like RESequence changed my line numbers. Now D/F 80 files will print.

One last thing: Line 230 was printed immediately after line 220 in the magazine. There was nothing wrong with the line, but it was a bit confusing. (Line 220 and 230 were inadvertently combined. Line 220 should end at (R)EDO". Line number 230 starts i. mediately after REDO-Ed.)

Adding DM1000 to GRAM Kracker

Miller Graphic's GRAM Kracker is a nifty device with many purposes. Making the TI99/4A system conform to one's own requirements is one of them.

The following comes from several sources, including the K-Town 99/4A User Group of Knoxville, Tennessee,

(Please turn to Page 45)

User Notes

(Continued from Page 44)

and the Front Range 99er Computer Club of Colorado Springs, Colorado. It has to do with combining Extended BASIC and Editor/Assembler and adding Disk Manager 1000. In this way, the power-up screen will display menu selections that include Extended BASIC, Editor/Assembler and DM1000. Talk about a multi-purpose utility! This requires a GRAM Kracker and expansion memory to be of any use. Here are the step-by-step directions:

1. Load the Editor/Assembler cartridge using the load module function.
2. Load the E/A Mover from the GRAM Kracker disk.
3. Move the Editor/Assembler to GRAM 7 and follow the screen prompts.
4. Load Extended BASIC using load module (include the Extended BASIC CALLs).
5. Using the save module function, save the contents of the GRAM Kracker. This will include both Extended BASIC and Editor/Assembler. When these files are loaded into the GRAM Kracker, both cartridges will appear as selections on the power-up menu.

The following instructions will add DM1000 as the third menu selection.

6. Load DM1000 using Extended BASIC or Editor/Assembler. After loading, press the GRAM Kracker reset switch. Select GRAM Kracker from the menu.
7. Select option five (Edit Memory).
8. Switch off the loader and the write protect function. Select GRAMs 1 and 2 on the GRAM Kracker panel.
9. Enter the start address of A000, end address of DAF2 and desitnation of g2056. Use function 2 of the editor to move DM1000 from the memory expansion to the GRAM Kracker.
10. Enter the memory address g2000 in the memory window.
11. Use Function 9 to enter the memory window. Enter the following hexadecimal code into the corresponding memory addresses:

```
>2000 AA 01 01 00 00 00 20 10 00 00 00 00
>200C 00 00 00 00 00 00 20 26 11 44 49 53
>2018 48 20 4D 41 4E 41 47 45 52 20 31 30
>2024 30 30 31 3A F2 BF 1D 00 20 56 BF 00
>2030 A0 00 BE BF 01 00 9F 31 00 08 AB F0
>203C 20 4E BF 4A 09 00 06 00 18 BF 4A 0B
>2048 00 06 00 4A 0F F0 78 78 78 78 78 78
>2054 78 78 04 60 C2 74 0F B0 00 A8 0F 89
```

12. Switch the write protect on, press the reset switch. You will now have a power-up menu that includes Extended BASIC, Editor/Assembler and DM1000.

Now you can load DM1000 in a matter of 2-3 seconds, without using a disk drive. (By the way, you may want to save the contents of GRAM 1-2 so that if you have to reload DM1000 you won't have to repeat this procedure.)

Business Graphs 99 and TI-Writer

If a picture is worth a thousand words, how many words is a chart worth? If you're trying to make a point, a chart can have tremendous impact. Just look at USA Today, a newspaper that sometimes will fill an entire page with little more than charts.

Integrating a chart with text can improve the appearance of any document, whether a term paper done for class or a business presentation. Even though TI-Writer isn't designed to handle graphics, users with Business Graphs 99 (reviewed in the March 1986 MICROpendium) can use the program below to convert a graph for use with TI-Writer. This item was written by Jack Coleman of the K-Town 99/4A User Group of Knoxville, Tennessee.

The program converts a Business Graphs 99 chart into a Display Variable 80 file that can be read by TI-Writer. Here's the program, which requires Extended BASIC.

```
100 REM GRAPH99 PROGRAM
110 REM GRAPH CONVERTER
120 REM USE WITH BG 99 TO CO
NVERT GRAPH TO BE USED WITH
TI-WRITER
130 REM BY MIKE McCANN, MODI
FIED BY JACK COLEMAN 7/86
140 REM
150 CALL CLEAR
160 PRINT "ENTER NAME OF BG
99          GRAPH FILE "
170 INPUT FN$
180 OPEN #1:FN$,INPUT ,DISPL
AY ,VARIABLE 132
190 INPUT "ENTER NEW FILE NA
ME ":FN2$
200 OPEN #2:FN2$&"/GPH",DISP
LAY ,VARIABLE 80
210 CALL CLEAR :: CALL SCREE
N(11)
220 PRINT "CONVERTING FILE T
O":"        DIS/VAR 80..."
230 FOR K=1 TO 200
240 LINPUT #1:A$
250 PRINT #2:SEG$(A$,1,80);
260 IF LEN(A$)>80 THEN PRINT
 #2:SEG$(A$,81,132);
270 IF EOF(1)THEN 290
280 NEXT K
290 CLOSE #1
300 CLOSE #2 :: END
```

Here's how to use it:

1. After creating a graph with Business Graphs 99, print it to disk using the printer function. This creates a D/V 132 file.
2. Convert this file into D/V 80 format using the conversion program above. The converted file will have a /GPH extension.
3. Write your text using TI-Writer and save the file in the usual manner.
4. Enter the formatter and call the text file. Instead of directing the file to the printer, print the file to disk.
5. Reload the editor and then load the new text file. Then merge the converted chart file into the text. Print the document using the Print File option, using a CR option (PIO.CR) or both the text and the graph will be printed incorrectly.

User Notes is a column of tips and ideas designed to help readers put their home computers to better use. The information provided here comes from many sources, including TI home computer user group newsletters. MICROpendium will pay $10 for any item sent in by readers that appears in this column. Mail tips to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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Software

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